



COAL AGE



Vol. 10

NEW YORK, DECEMBER 23, 1916

No. 26

Peace on Earth



HIS IS THE SEASON of the year that the Christmas message, "Peace on earth, good will toward men," stares at us from nearly every printed page; and we hear the choirs rehearsing it again and again as we pass our churches in the evening. Yes, peace is in the very air; but peace in the air may mean but little. Reading the Christmas message or chanting it does not necessarily make for peace. If it did, the war in Europe would have been brought to a close on a Christmas two years ago! Since then another Christmas has passed, and still another is passing.

Emerson had this to say about peace: "Nothing can bring you peace but yourself; nothing can bring you peace but the triumph of principles."

There are coal-mining companies today that are reaping profits that would have seemed unbelievable only a few months ago, and yet are appropriating most of these swollen earnings to themselves without more than a passing thought for their employees. The memory of the worker is not unlike the memory that the chronicler of the circus has given to the elephant.

There are mining companies today that are blinded by spot offers at high prices for their coal and in consequence are shutting their eyes to contracts that were executed in good faith only a few short months ago, contracts that alone stood between the mine and bankruptcy at the time they were executed; contracts that were the culmination of years of striving. Contracts rest on precedent, and future precedent will often look back to the present.

There are coal-mining employees today who are blocking efforts of their employers to increase outputs, outputs that are sorely needed to take care of plants whose boilers are clamoring for coal and whose workers are threatened with idleness. The patriotism of the mine worker and the mine worker's organizations have often been questioned by the general public, even without direct evidence.

PEACE ON EARTH, GOOD WILL TOWARD MEN

There is a saying that has come down to us from the Italian that runs like this, "Peace would be universal if there were neither thine nor mine."

What means "mine and thine" now to the millions that have laid down their lives in the struggle across the water; the millions that had so much in common with you and me.

"Nothing can bring you peace but yourself"; Mr. Mine Owner and Mr. Miner, Mr. Mine Manager and Mr. Mine Laborer, there can be no universal peace unless you and I make it.

Ideas and Suggestions

A Method for Taking Long Sights

The accompanying sketch shows a very simple and effective method for taking long sights in outside surveying. It consists simply of folding a large piece of white paper around the plumb-bob string in the manner shown in the



SHOWING SIMPLE METHOD OF INCREASING THE ACCURACY OF LONG SIGHTS

sketch, the plumb-bob of course being held accurately over the point. The instrument is sighted on the lower corner of the paper, which, having a white field, presents an unusually favorable opportunity for a close and accurate sight.

¶

The Inspector's Plea to the Mine Worker

BY SIM C. REYNOLDS*

In the broad halls of industry both you and I have a definite niche to fill. Working apart, both of us in our own way, we can do much toward the fulfillment of our duty; working together, we can do vastly more. You cannot help me in all things, neither can I be of service to you in all things; for, while my mission is solely to look after your welfare, it stops at the physical. Your spiritual security is a matter that lies between yourself and your Maker. In your creed, color or political bias I am not interested; but your physical safety is my whole concern, as it must of necessity be yours if you would live and prosper.

To heal a wound, to soothe a pain, caused in the course of your daily toil, is work for other hands than mine. As for me, I must content myself when I have done my utmost to prevent a recurrence of that wound

*Houston, Penn.

or pain. As the pilot guides the ship past dangers with which he, better than others, is conversant, so must I endeavor to guide you in the paths of safety through all the work your hands find to do. I peer into the darkness of the underground for dangers which may befall you. I test the wheels and vital parts of the machinery that drops you into darkness and that rushes you through the blackness, carrying you to your destination. It is my mission to seek therein for weaknesses and defects which may cause disaster, that you may rest in safety to your journey's end.

Yet, howsoever careful and conscientious I may be in seeking and removing these dangers of the underground, you have it in your power to undo much of my work. Without your coöperation much of the usefulness of my labor may be lost—and perhaps your life or possibly your happiness. I may throw a safeguard around the thing of steel which, unseen, may maim and kill, but at the best this is but partial security. To make it altogether safe I must have your help—your coöperation. With you, I can promise the limit of safety; without you, my work may be in vain.

Give me your assistance and encouragement while I work to ward off the dangers that everywhere beset you. Work together with me in an effort to remove those things that tend to make widows and fatherless children, and cripples and subjects of charity out of strong men.

¶

The Field of the Electrical Engineer in Coal Mining

BY WILHELM SCHAFFER*

Before the advent of electricity in coal mining, when haulage was performed entirely by mules, and pick mining was in vogue, there was no need for an electrical engineer in the coal-mining industry. However, since electricity made fast strides and encroached on the duties formerly performed by mules and picks, an entirely different situation has been created.

With the coming of electricity there arose the need of plants for the generation of power and electrical equipment, such as locomotives, cutting machines, pumps and illumination, was installed in or around the mines to consume this power. Naturally, such equipment needs care, and many mines have their electricians and electricians' helpers to perform that function. The duties of the electrical engineer need not conflict with those of the electrician, except that the former should naturally supervise the electrician's work and coöperate with him for the welfare of the coal operator.

The ideal place for the electrical engineer is a new operation, where he can develop his ideas to the best advantage, but most probably he will be in charge of a mine that has been working for some time. The electrical

*Chicago, Ill.

engineer in coal mining should have the following main functions in his mind upon which to work: Constructive, Executive and Reconstructive—with a fundamental idea of efficiency covering these items.

The first point under consideration is Constructive work, which readily defines itself as the installation of new machinery in the power plant, such as generators or cutting machines in the mine itself. Perhaps the operator will say, "Well, my electrician can do that work." And the answer is, "Sure he can, but can he do it efficiently and with the minimum cost to you?" It takes a man of engineering training to study the condition or conditions under which a certain piece of machinery is to operate, and to decide what type will perform its function most efficiently and economically under all the possible circumstances that may arise.

For example, take the installation of a new piece of machinery in a power house. The electrical engineer will first have to take into consideration the machinery already installed, and plan for something that will work in unison with it and still have his eyes open so as to procure a type of sufficient capacity to meet the needs of the mine for 25 years to come. True, the coal operator can call on the manufacturer for engineering service, but there is nothing like having a good man on the job all the time, so as to avoid costly delays.

The second point under consideration is Executive work. After designing or planning some work, it naturally has to be carried out in practice; and unless the plans of the designer are strictly adhered to, the operation of the machine will not perhaps come up to what is expected of it. Consequently, the electrical engineer must see that all the details of his original plans are strictly carried out, and the electrician of the mine with his helpers are the proper agents to perform this function under the direct supervision of the electrical engineer.

The last point named is Reconstructive work, which is the taking care of work already installed and replacing inadequate machinery. The engineer should keep a record of the date when all electrical equipment is purchased together with a log of the performance of the same; and when any of the apparatus does not hold up to specifications, he should investigate the causes. If they can be remedied, he should develop a way to put them in working condition, so as to avoid unnecessary expense to the operator.

Summarizing, the duties of the electrical engineer in coal mines are as follows: (1) Constructive, (2) Executive and (3) Reconstructive, with the basic idea of efficiency overtopping all.



Uniformly Spaced Latitude and Departure Lines

By D. GERBER*

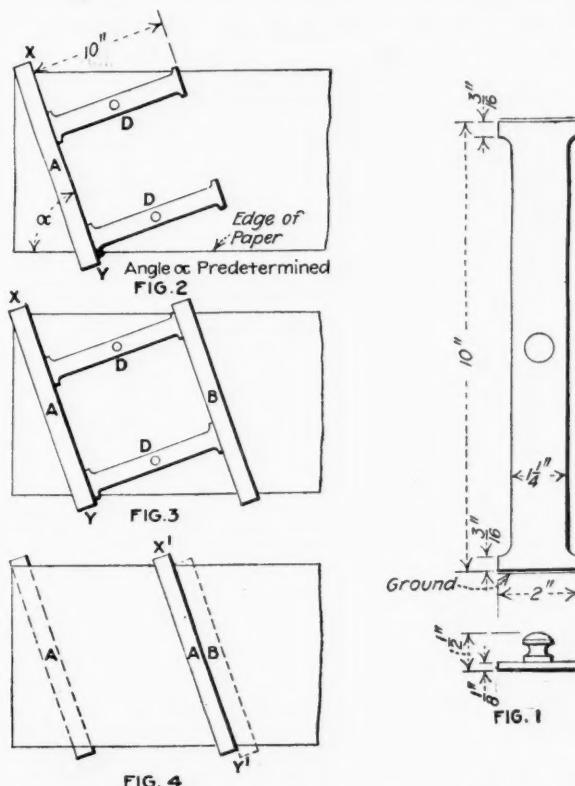
A method is here suggested and described in contradistinction to the usual method of drawing lines through trammed or sealed points, starting from a predetermined line. Use is made of two distance pieces having ends parallel and ground accurately to length (10 in. long), made of $\frac{1}{8}$ -in. steel and of the form shown in Fig. 1.

On the predetermined line XY, shown in Fig. 2, adjust the straightedge A and the two distance pieces D,

*Chief Engineer, Pittsburgh Terminal Railroad and Coal Co., Pittsburgh, Penn.

being careful to have them fit snugly. With a little practice, this fitting can be accurately done by the sense of touch.

Then place the straightedge B in contact with the outstanding ends of the two distance pieces D, as shown



FIGS. 1 TO 4. METHOD OF APPLYING DISTANCE SPACERS

in Fig. 3. The edges A and B will be parallel and spaced just 10 in. apart.

At this stage it would be well to weight the straightedge B. Then remove the distance pieces and shift the straightedge A into contact with B, as shown in Fig. 4. Transfer the weight from B to A and remove B, thus leaving A in a position to draw a second line.

By exercising care in the various shifts, and in manipulation of the ruling pen, accurate spacing may be done.



Mushrooms Will Be Grown in Pennsylvania Coal Mines by the Colin Mushroom Co., with headquarters at Arnold, Westmoreland County, a town on the bank of the Allegheny near Pittsburgh. There are about 20 old workings of the Valley Camp Coal Co., which have been exhausted of their coal supply and have not been used for many years, and these have been leased by the new company and will be provided with mushroom beds. About 25 men will be employed in this novel industry. H. C. Kinloch is president. Evidently the "Coal Age" article on mushrooms dated July 31, 1915, is bearing fruit—but then, perhaps, mushrooms are not rightly termed fruit.



Much Atmospheric Oxygen Is Absorbed by Mine Timbers—The United States Bureau of Mines placed sawdust and shavings of different kinds of wood in large containers. At the end of 39 days the air in these containers was practically unchanged. The shavings and sawdust were then moistened and, 16 days later, additional air samples were taken. A marked increase in carbon dioxide and decrease in oxygen was noted. At the end of five months, air samples taken from the containers holding the moist sawdust showed that all the oxygen had been consumed and all but a small percentage of it converted into carbon dioxide. The containers in which shavings were used showed about 10 per cent. carbon dioxide and 10 per cent. oxygen.—Edwin Higgins in Industrial Commission Bulletin of State of California.

The Bituminous Coal Mines of Crow's Nest Pass--I

By P. M. SHERWIN*

SYNOPSIS—The coal fields of Alberta and British Columbia are separated by the main range of the Rocky Mountains. Each group consists of a number of distinct areas. Coals from the different beds strongly resemble each other, and all coke readily.

The territory between Burnis, Alberta, and Elko, British Columbia, includes all the coal fields, containing the high-grade bituminous coals of the Kootenay age in Crow's Nest Pass, which are traversed by the Crow's Nest branch of the Canadian Pacific Ry.

These fields may broadly be divided into two groups, of which the most easterly lies in the Province of Alberta, being separated from the western or British Columbia group by the main range of the Rocky Mountains. Each

ft. and contain from five to six seams of coal of an aggregate thickness of 50 ft., while a section measured near Morrissey, on the British Columbia side of the Pass, showed some 3,200 ft. of Kootenay rock with 216 ft. of coal in seams over 1 ft. in thickness. Similarly, the Fernie shales of the Jurassic age, underlying the Kootenay, are much thinner in Alberta than they are in British Columbia, being about 650 and 3,000 ft. respectively.

The main range of the Rocky Mountains, forming the boundary between Alberta and British Columbia, intrudes between these two groups of coal fields and is composed almost entirely of massive beds of the Devonian-Carboniferous age. At Blairmore, on the Alberta side of the Pass, contact between the Mesozoic and Paleozoic rocks is reached.

A cursory examination of the Rocky Mountains shows as the most outstanding feature that the several ranges



FIG. 1. MAIN RANGE OF ROCKY MOUNTAINS SEPARATING BRITISH COLUMBIA AND ALBERTA

of these groups consists of a number of separate areas of coal beds.

On the Alberta side of the mountains these various coal areas are divided by a series of great faults, following closely the strike of the strata, while the individual areas have been subjected to severe folding and minor faulting. The British Columbia group is composed of a series of more or less regular basins. The largest of the Alberta faults, at Burnis, marks the beginning of the Kootenay formation, coming from the east. This fault runs almost due north and south, and its displacement is estimated at more than 1,000 ft.

The coal is contained in these Kootenay rocks (lower Cretaceous) which consist of hard gray sandstones and gray, black and carbonaceous shales, while near the top is found some hard siliceous conglomerate. In the Alberta group the Kootenay rocks have a thickness of about 700

are merely a series of inclined blocks of the harder rocks of the Paleozoic age, capped by softer Cretaceous beds, except in the immediate vicinity of Crow's Nest Mountain, where almost horizontal beds of Paleozoic limestone have overridden the Cretaceous rocks along a great thrust plane.



FIG. 2. LEITCH COLLIERY AT PASSBURG, ALTA.

*Engineer, Franco-Canadian Collieries Co., Frank, Alta.

The first of the Kootenay formation is seen at Burmis, where the mine of the Davenport Coal Co. is situated. This mine has been idle for some time.

The coals of the whole formation are similar in character, coking readily and having splendid qualities for steam raising.

The following proximate analyses from air-dried samples give a general idea of the character of the coal. All the analyses, with the exception of that of the Frank coal, were made at the laboratory of McGill University in Montreal.

TABLE OF ANALYSES OF BITUMINOUS COALS FROM CROW'S NEST PASS MINES

Locality	Mois-ture	Volatile Combus-tible	Fixed Carbon	Ash	Remarks
Belle Vue No. 1 seam.	0.2	27.5	56.8	15.5	Run-of-mine coal
Coleman No. 4 seam.	0.6	23.8	59.5	16.1	Run-of-mine coal
Michel No. 8 seam.	1.1	23.8	65.0	10.1	Coal screened and picked at mine
Hosmer No. 8 seam.	1.3	27.6	63.7	7.4	Coal hand-picked at testing plant
Coal Creek No. 2 seam	1.3	26.0	63.8	8.9	Coal screened and picked at mine
Frank, Great seam	1.2	26.7	56.7	15.4	Run-of-mine coal

D. B. Dowling, of the Canadian Geological Survey, has estimated the coal contained in the British Columbia field at 22 billion tons.

The Coleman area of 35 sq. mi., with 38 ft. of coal, has been estimated to contain over a billion tons. The

If the reader will now imagine himself boarding the train on the Crow's Nest branch of the Canadian Pacific Ry., we will visit the various mines along the line as we travel westward toward British Columbia.

Half a mile from Lethbridge the train crosses the deep, wide valley of the Old Man River on what is known as the highest and longest steel trestle in the West. After we travel about 70 miles through the prairie, we reach the foothills of the Rockies. In this district there are numerous lignite mines of the Belly River formation, most of which however are now shut down.

At Burmis, 72 miles from Lethbridge, the first of the Kootenay formation is seen. Here the Davenport Coal Co. is operating in six seams that vary from 3.4 to 6 ft. in thickness. The coal is mined by the pillar-and-stall method and is hauled to the tipple by means of an endless rope. The entire equipment is electrically operated. This mine, also, has been idle for several years.

After leaving Burmis, the railway follows the north bank of the Old Man River. Good exposures, consisting of rocks of the Dakotas, which overlie the coal-bearing Kootenay formation, can be seen in the distance. The strata in this vicinity are quite extensively folded, and about one mile west of Burmis is an important fault with a downthrow of several hundred feet.

Two miles farther west we come to Passburg and the plant of the Leitch Collieries. Five seams of coal have been proved, 2, 6, 5, 4 and 10 ft. thick respectively. This mine is also worked on the pillar-and-stall system, as in fact are nearly all the mines in this district. On account of the steep pitch, however, which here reaches 60 deg., the rooms are driven diagonally up the incline.

The coal is hauled in the main gangway and to the tipple by gasoline locomotives. The tipple is of the Phillips crossover type and is equipped with shaking screens and picking tables with a capacity of 1,000 tons in two shifts. From the tipple the slack coal is elevated to a Luhrig jip type of washing plant, and from there it is transported by electric lorries to the coke ovens.

There are here installed 101 ovens of a modified beehive type, with mechanical leveling and pushing devices. Owing to financial difficulties, this mine had to shut down about two years ago.

The next important point on the line is Hillcrest station, which serves both the Hillcrest mines and Bellevue. The former is about two miles to the south, and the latter is to the right, on a bluff directly overlooking the railway, which here closely follows the bank of the Old Man River.

At Bellevue the West Canadian Collieries, Ltd., operates two mines known as Nos. 1 and 2. Both are worked in

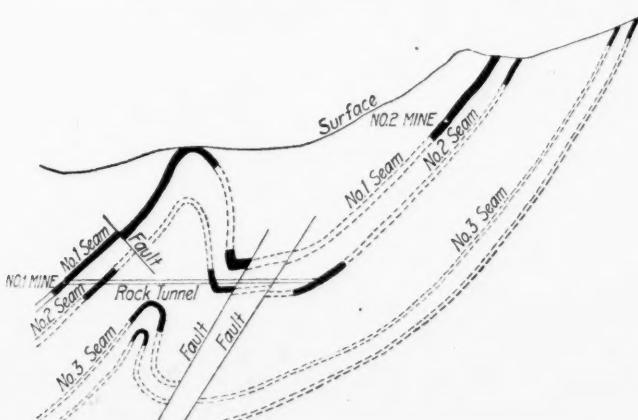


FIG. 3. SECTION THROUGH BELLEVUE MINE

Blairmore-Frank area, 90 sq. mi. and irregular in shape, with 50 ft. of coal, at 4½ billion tons. The Livingston area, to the north of Blairmore, has at present only been opened at Lille and contains approximately 343 sq. mi., with about 26 billion tons of coal. All the seams are more or less pitching and reach, as at Frank, a pitch as high as 85 deg. In some places also they are slightly overturned.



FIG. 4. BELLEVUE MINE NO. 1; MINE MOUTH IS NEAR LEFT OF PICTURE

FIG. 5. BELLEVUE NO. 1, WITH TURTLE MOUNTAIN IN BACKGROUND

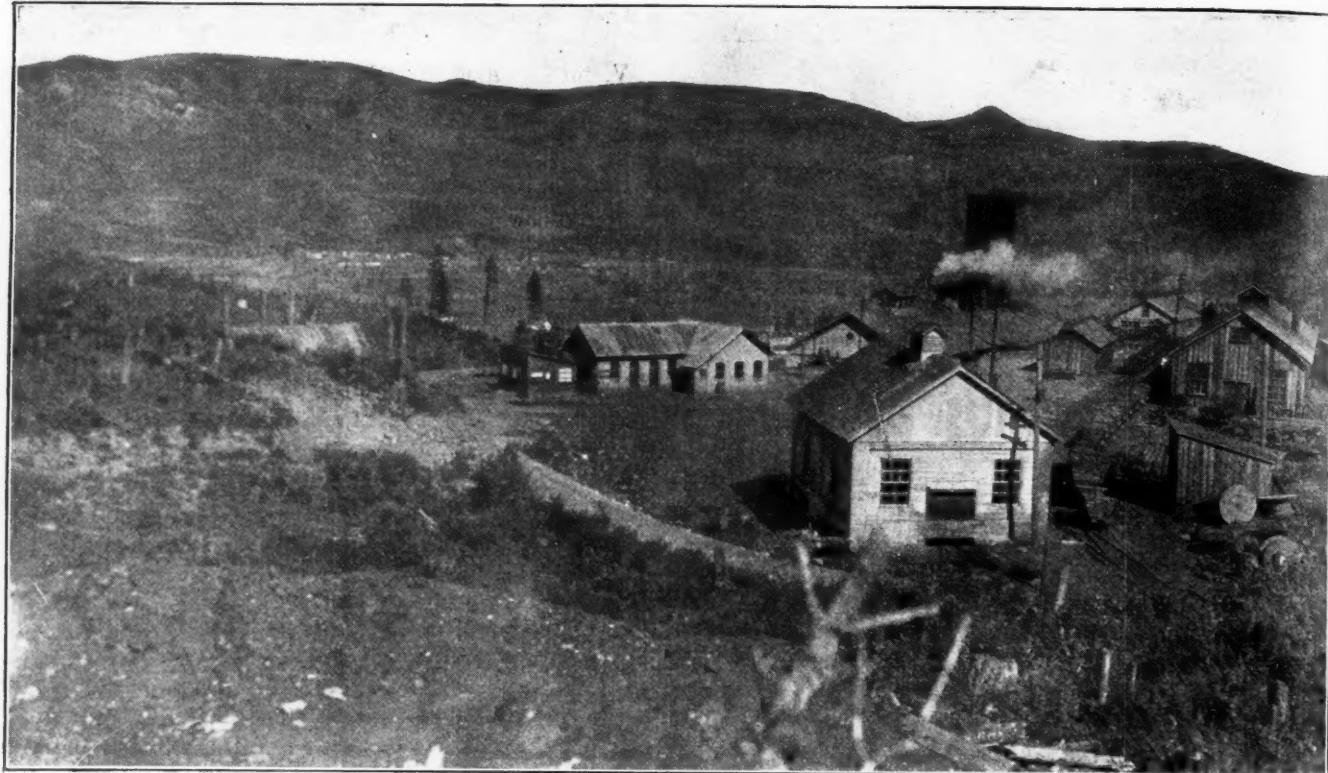


FIG. 6. HILLCREST MINE, SHOWING BELLEVUE VILLAGE ACROSS VALLEY

No. 1 seam, the most westerly and the largest of four proved. No. 1 mine is opened by a rock tunnel driven directly into the bluff and about 40 ft. above the river. The seam has an average thickness of 14 ft. A rock tunnel disclosed an interesting double fold in the seam, as shown in Fig. 3. While No. 2 seam was cut in three places, Nos. 1 and 3 seams were missed.

This mine is probably the most extensive in the Pass, having a daily capacity of 3,000 tons. Its workings reach into the hills for three miles, the system of mining being the usual pillar-and-stall method. The pitch here is from 50 deg. west at the mouth to 25 deg. west. The same seam was tapped by No. 2 mine high up on the hill-side, and before the double fold previously mentioned had been proved, it was believed that this mine was working on No. 2 seam. The two mines are now connected.

There are two fans in No. 1 mine, a Jeffrey exhaust of 60,000 cu.ft. capacity and a Capell exhaust of 120,000 cu.ft. capacity, while No. 2 is ventilated by a Sullivan force fan of 80,000 cu.ft. capacity. Another Jeffrey fan is in process of installation at the latter mine.

The haulage is done by compressed air, nine locomotives being in use. The main haulage extends into the main gangway for 6,000 ft., with a charging station every 1,000 ft. One locomotive does all the main haulage work, the others being used for gathering in the two mines. The trip consists of 40 three-ton steel cars, the total weight of the load being about 160 tons, with a grade of 1 to 0.5 per cent. in favor of the load. The locomotives have to be charged twice going in and once coming out.

The coal from No. 2 mine is gathered by horses at the face, thence by air motors for 4,000 ft. to the mouth of the mine and a short distance along the surface, where it is dumped into a large chute of several thousand tons' capacity that connects with the gangway of No. 1 mine, where the coal is reloaded and transported to the tipple.

The mines are fairly wet, especially No. 1. Since, however, the lowest level is above the river bed, the drainage is natural and no pumps are employed.

There is a considerable quantity of gas given off, but the ventilation is so good that gas has been reported only once or twice during the last year. Wolf safety lamps are used, while haulage crews are equipped with Edison electric lamps.

The tipple is equipped with a hydraulic car dump, capable of handling 2,000 tons in 8 hr. A bar screen is installed. This screen, however, is only used for boiler coal at the present time.

The Hillcrest mine was opened near the outcrop, which is about 600 ft. above the bottom of the wide valley. The coal is on the western limb of the syncline on which the Bellevue mines are located, and the same seam is worked. There are two slopes following the coal down a westerly pitch of from 18 to 25 deg. into the hill. Gangways are turned off every 500 ft., to the right and left.

The seam is faulty in places, so much so that the capacity of the mine has recently been reduced to 500 tons



FIG. 7. TURTLE MOUNTAIN SLIDE, BELLEVUE, FRANK AND THE "GAP"

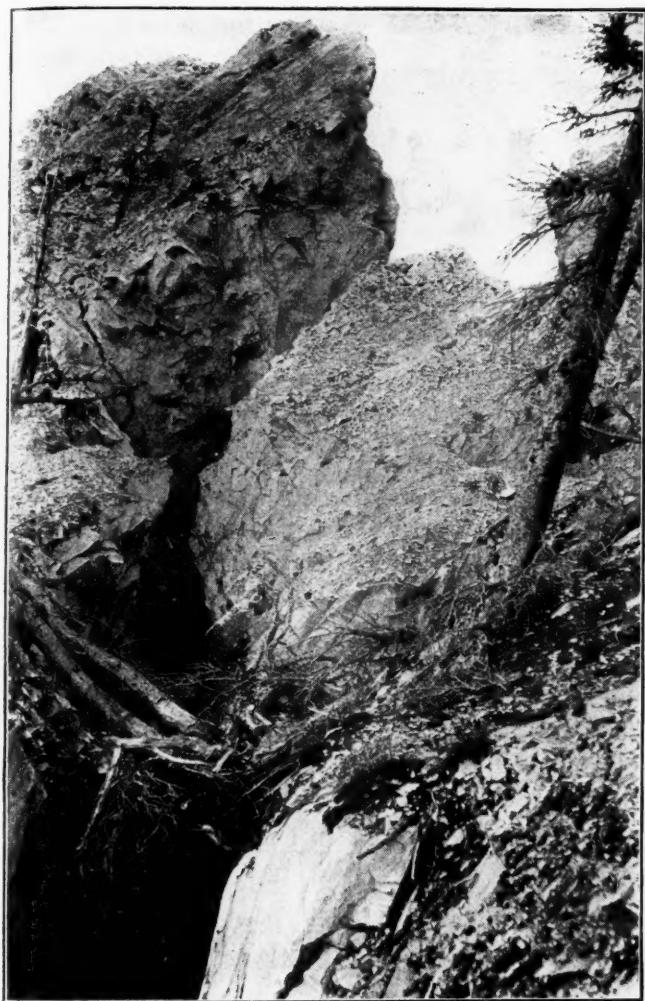


FIG. 8. LARGE FISSURE ON TURTLE MOUNTAIN, 20 FT. WIDE, DEPTH UNKNOWN

per day, about one-half the normal output. Six 2½-ton cars are hoisted at a time. The outside haulage is performed by steam locomotives, the distance to the tipple being about 1,500 ft. An up-to-date retarding conveyor has been installed to transfer the coal to the bottom of the valley, with a Phillips crossover car dump at the top and a bar screen and picking table equipped with tipple at the bottom. Run-of-mine only is loaded at present.

This mine was the scene of the great disaster on June 19, 1914, when 189 men lost their lives. The exact cause of this explosion has never been determined, there being a considerable diversity of opinion. The general belief seems to be that a great fall of rock caused sparks that ignited the gas. This mine is still very gaseous and safety lamps only are used.

Leaving Hillcrest station the railway continues up the bank of the river, and a short distance to the west the immense slide of Turtle Mountain is entered.

■

Powdered Coal in Storage Will Ignite Spontaneously more rapidly than before pulverization. When such powdered fuel contains 0.75 per cent. of moisture and 1 per cent. of sulphur, it will invariably fire within six days. If the moisture be increased to over 1 per cent. and the sulphur to 4 or 5 per cent., spontaneous combustion may occur within 24 hr. Probably the temperature at which powdered coal is delivered to the storage bin and the sulphur content of the coal influence the rate of spontaneous combustion more markedly than does the percentage of moisture.—C. J. Gadd, Journal of the Franklin Institute, September, 1916.

Losses in Coal Burning

Victor J. Azbe, of St. Louis, Mo., in a paper on "Power-Plant Efficiency," read at the annual meeting of the American Society of Mechanical Engineers, in New York City, on Dec. 6, took up the matter of the fuel wasted and stated that this waste is increasing as more power plants come into existence. Reduction of this waste is imperative, he argued, for the coal resources are not inexhaustible and, even if they were, it still is the duty of the mechanical engineer to conserve the financial power of the commercial public.

The same people who would painstakingly strive for an extra mile or two per gallon of gasoline in the operation of their automobiles are maintaining power plants in their factories that are wasting 30 per cent. or more of the coal burned.

In the ordinary power plant the preventable losses total about 30 per cent., or about \$324,000,000 for the whole country each year, to say nothing of the natural gas and crude oil wasted. This does not take into account the cost of handling and firing, and investment in unnecessary boilers, machinery and labor. If everything could be computed, the total loss would exceed half a billion dollars, and all owing to an inefficiency that can be subdivided into lack of foresight and business ability: improper design and improper management, and inefficient operation.

Often, when a power-plant installation is planned, the owner fails to consult a competent designing engineer; poor advice from incompetent persons, prejudice, and the fear of investing needless money do the rest. All in all, owners are as much in need of education in power-plant economies as their employees, and should be impressed with the following possibilities:

From 10 to 30 per cent. fuel-consumption reduction without additional investment, simply by more efficient operation; up to three times the amount of power from the same amount of fuel, by installing proper equipment; investments in a power plant can be made to bring from 10 to 100 per cent. interest. Specialists on economical power-plant operation and design should be consulted.

IN LIGHTER VEIN

A PROBLEM IN PERCENTAGE

Back in the early 90's, before the jiggling of anthracite had reached its present state of efficiency, it was necessary to have some boys to pick the coal out of the refuse.

In one of the breakers near Hazleton, Penn., an old Irishman, Dan McDade, was boss of the boys on this work. A daily inspection was made of the slate pocket as a check upon Dan and his gang, the inspector usually taking a 100-lb. sample.

One day, however, the inspector was in a hurry and took but one-eighth of the usual sample, or 12½ lb., and upon examination found it to contain 15 per cent. of good coal. When the foreman received the report of the inspector, he at once called Dan to task for neglect of duty, whereupon the latter became very indignant and exclaimed: "He's lying to ye, sor! I was watching 'im, and there was only 12½ per cent. whin 'e weighed the hull sample.—A. L. Parrish, Kingston, Penn.

Good Results Secured in the Pittsburgh Seam

BY THOMAS BRENNAN*

SYNOPSIS—Describes a system of mining that reduces costs, affords greater protection to the men employed, and secures a larger percentage of extraction as well as a larger proportion of lump coal.

The system of room-and-pillar mining here described is admirably adapted to the Pittsburgh seam of coal in that section or territory lying in western Pennsylvania. Here the coal measures are immediately overlain by 70 ft. of strata consisting entirely of shale formations and roof coal. These strata lie between 20 ft. of a sand rock and the coal measure.

Extreme difficulty has been encountered in this section of the Pittsburgh coal seam for a number of years, and the results obtained have been far from favorable.

Various systems of room-and-pillar mining have been introduced in this part of the seam, and for various reasons have been complete failures with respect to the percentage of coal recovered. To meet the market requirements it is necessary that as large a percentage of lump coal be secured as possible.

The advantages of this system of mining are: The high percentage of lump coal obtained; the high percentage of coal recovery; a decrease of accidents to workmen; complete immunity against shooting into old gob suspected of containing explosive gases, and a general decrease in cost.

The system may be described as follows: Face entries are driven on the four-entry plan, the distance between the centers of the entries being 60 ft. The two center entries are used as haulage and manway entries and also as intake airways.

The advantage of using the two center entries as intake airways is obvious if the operation of the trolley type of electric locomotive is desired. It is also advantageous to have workmen travel along a manway that is ventilated by a fresh intake air current. The two outside face entries are used exclusively as return air courses.

Butt entries are turned right and left off the face-entry haulage road on 340-ft. centers between each pair of butts. The productive butt entries are turned on an 85-ft. radius curve off the face-entry haulage road. This provides an easy curve for haulage purposes and requires a 24-in. gage track.

The center distance between the productive butt entry and the entry air course is .50 ft. Butt entries are always driven up to line or destination before rooms are turned off.

Rooms are only turned off one entry—that is, off the production butt—except No. 1 and 2 rooms on each pair of butt entries, which are driven narrow, being about 14 ft. wide and carrying one line of selected round posts not less than 6 in. in diameter set on 4-ft. centers.

Rooms No. 1 and 2 of each pair of butts are turned as line rooms and used as subsidiary air courses between

each pair of butt entries. All rooms driven off the butt entries are turned on 40-ft. centers.

One distinct advantage of using 40-ft. centers between rooms lies in the fact that the standard length of steel rail used for mining purposes is 30 ft. Using a 10-ft. piece of rail as a filler between each room center avoids waste in cutting rails, as three fillers can be cut from each standard length. This system of track laying is economical and adaptable where rooms are turned and developed and pillars extracted on the retreating system of mining.

It is not necessary to insert castings or room frogs at each succeeding room neck, as the development of the entire mine is prosecuted to such an extent as requires the extension of permanent tracks. This insures a solid track virtually the entire length of the butt entry, except at the top of the entry where rooms are broken off.

This feature reduces to a minimum the possibilities of an accident due to broken car wheels pounding on latches or frogs, and allows the attainment of higher speeds. It also insures and promotes the economic transportation of the mine product.

SOME POINTS ON TRACKLAYING

When the development of rooms and the extraction of pillars has been carried to such an extent as to necessitate the turning of additional rooms, it will not be necessary to cut rails in order to insert frogs for room switches, if proper care has been exercised in locating the frog for No. 1 room on each productive butt entry. If this has been carefully placed, the process of inserting room frogs as they are required is simple. All that is necessary is to loosen the fish plates at one end of every 40 ft. of rail where it is desired to turn a room. The 10-ft. piece of rail is jacked to such an extent as to form the wing rail of the switch. The frog is then inserted and the other rails put in place and forced into the proper curvature.

When it is found that a parting or room switch is no longer necessary on account of the room and pillar being finished, the frog and heel rails may be removed or taken out, the wing rail jacked back into position to form straight track and the whole joined together by fish plates without any necessity for cutting rails.

This system of tracklaying also requires only a minimum number of parting or room switches to be carried in stock for a certain given production.

As noted previously, rooms are only driven off one entry. The productive butt and rooms are driven 280 ft. long. This length of room insures an adequate barrier pillar of 55 ft. between the ends of rooms on the outby productive butt and the air-course entry of the inby productive butt. The advantage of a barrier pillar of this thickness is twofold: It provides ample protection in preserving the air course of the inby butt entries and also provides a pillar of such thickness as to allow the splitting of the barrier pillar by a machine-driven room 18 ft. wide.

The direction of the room driven is parallel to the length of the barrier pillar. This method of drawing

*Herminie, Penn.

the pillar has three distinct advantages—it affords protection to the workmen drawing pillars; it provides for a higher percentage of machine-mined coal; and only a minimum amount of track work is necessary for a maximum percentage of coal recovery.

This may be illustrated as follows: By the use of one parting or room switch it is possible to secure the following amounts of barrier and chain pillar coal—barrier pillar 150 ft. long by 55 ft. wide, chain pillar 150 ft. long by 20 ft. wide. This in itself should warrant the adoption of this method of room-and-pillar mining in mines subject to heavy roof pressures.

One of the salient points, or features, of this system of mining is that all rooms are turned and driven in the direction of the solid body of coal.

ADVANTAGES OF THE SYSTEM

The benefits that may be derived by the mine worker and operator where this system is employed in mines and where the product is paid for and sold on the lump-coal basis are many, and may be partially enumerated as follows:

The earnings of machine loaders and coal cutter operators are increased, due to the fact that both miners and cutters are paid on a lump-coal tonnage basis. It is essential to their interest that a high percentage of lump be obtained. The same amount of labor is expended by both loaders and machine men in cutting and loading out a place of specified dimensions that will yield 70 per cent. lump coal as there is in cutting and loading out one that will yield 80 per cent. of lump coal.

What this means to the loaders and machine men will be evident from the benefits accruing to them. As an illustration, a place of certain dimensions will yield 30 tons of mine-run coal. Cutters and loaders are paid on a lump-coal basis, the price per ton to the loader being 13c., while cutters are paid 10c. per ton.

A certain expense is incurred by the loader in the purchase of powder and fuse for shooting his coal. In most instances this expense is the same regardless of whether the percentage of lump coal obtained is 60 or 80 per cent. of the contents of the place to be mined.

Hence, briefly, the return which a loader will receive for loading out a room where the entire contents is 30 tons of mine-run coal, and which yields 60 per cent. lump, is 18 tons of lump. This multiplied by 43c. per ton yields \$7.74. There will be a deduction of say 46c. for explosives used in blasting down the coal. This amount deducted from the loader's earnings leaves a balance of \$7.28, which is paid to the loader for loading out a room that yields 60 per cent. lump coal as specified by the above conditions.

If 70 per cent. lump coal is produced under the prescribed conditions this represents 21 tons to be paid for. At 43c. per ton this is equal to \$9.03, which the loader receives for the same amount of work performed as in the previous instance. The deductions for explosives will be the same regardless of the percentage of lump coal won. Deducting 46c. from \$9.03 leaves a balance of \$8.57, the net gain to the machine loader is then equal to \$1.29, or 17.7 per cent. increase in wages for the same amount of work performed.

It is therefore to the financial interest of the loader and cutter to devise methods of shooting and mining

that will yield as high a percentage of lump coal as may be secured consistent with the safety of those engaged in its production.

In addition to the foregoing, in many mines the coal is immediately overlain with a draw slate 10 to 12 in. in thickness, which on account of its structure is a dangerous factor. This draw slate has to be taken down and gobbed or loaded out in mine cars. The task of taking down, loading out or cleaning up draw slate in many instances takes up, conservatively speaking, 20 per cent. of the loader's total time. The time required to perform this dead work remains constant regardless of whether the percentage of lump coal won is 60 or 80 per cent. of the entire contents of the cut shot down and loaded out.

Looking at the question from all angles, it is essential that all the loader's efforts be directed to obtain a high percentage of lump coal through intelligent and practical mining methods.

At some operations the low percentage of lump coal obtained may be attributed to the system of mining employed. This may be such as to invite squeezes, which in turn react to the detriment of the operator, and may be reflected in increased timber costs as well as other items of expense.

General labor costs for timbering and cleaning up roads and falls throughout the entire mine will be increased particularly where the percentage of coal recovery is low. These items of expense may be enhanced to such an extent as to render it almost impossible to operate the mine on a profitable basis.

Any such system of mining cannot be considered economical from the standpoint of either the miner or the operator, and its application secures only an indifferent degree of success. It can in no wise compare with the system of mining where rooms are driven only off one entry and into a body of solid coal.

X



COAL AS THE PUBLIC SEES IT

An Automatic Tipple Near Houtzdale, Penn.

By H. V. SCHIEFER*

SYNOPSIS—The cages are double-decked, yet carry only one car at a time. The cars are automatically spotted, caged and uncaged by gravity. The dump is power operated. Two men handle the entire tipple equipment, dumping eight cars per minute. The capacity of the tipple is 2,000 to 2,500 tons per day.

The Eureka No. 29 tipple of the Berwind-White Coal Mining Co., near Houtzdale, Penn., in the southern part of Clearfield County, is probably the most completely automatic tipple in the Clearfield district. This tipple was designed with the object in view of reducing the number of operators to a minimum. Automatic eagers and spotters, double-deck cages and power dumps are used throughout. An idea of the saving in labor may be gained from the fact that two men can operate this tipple with a capacity of 2,000 to 2,500 tons per day, while it takes four to six men on an average tipple in the same district with a capacity of only 1,000 tons per day.

The operation of the equipment is as follows: A trip of loaded cars brought to the shaft is delivered one car at a time by the automatic car spotter to the lower deck of the

double-deck cage. When the cage is hoisted to the tipple level, the horns on the lower deck automatically open and allow the car to run by gravity to the transfer dump. The cars are fed to the transfer dump one at a time by an automatic car spotter controlled by the dump.

After the car has been discharged, it is automatically deposited by the transfer dump onto the upper deck of the tipple and runs by gravity from this point to the car spotter next to the cage. The operation of this car spotter is controlled entirely by the cage and allows the empty cars to run one at a time by gravity onto the upper deck of the cage at the same instant that the loaded car runs off the lower deck. Thus the operations of discharging the loaded car from the cage and receiving the empty car are performed simultaneously. When the cage reaches the bottom of the shaft, the upper deck, which carries the empty car, is automatically tilted so as to discharge the empty car by gravity.

To dispose of a load of slate as it is received on the tipple there is provided a hinged portion of track immediately in front of the transfer dump. This can be closed and the car run through the dump and thence out to the slate trestle.

The tipple is located near the center of a tract of about 2,000 acres, and the shaft is sunk 177 ft. to work a good

*Cleveland, Ohio.

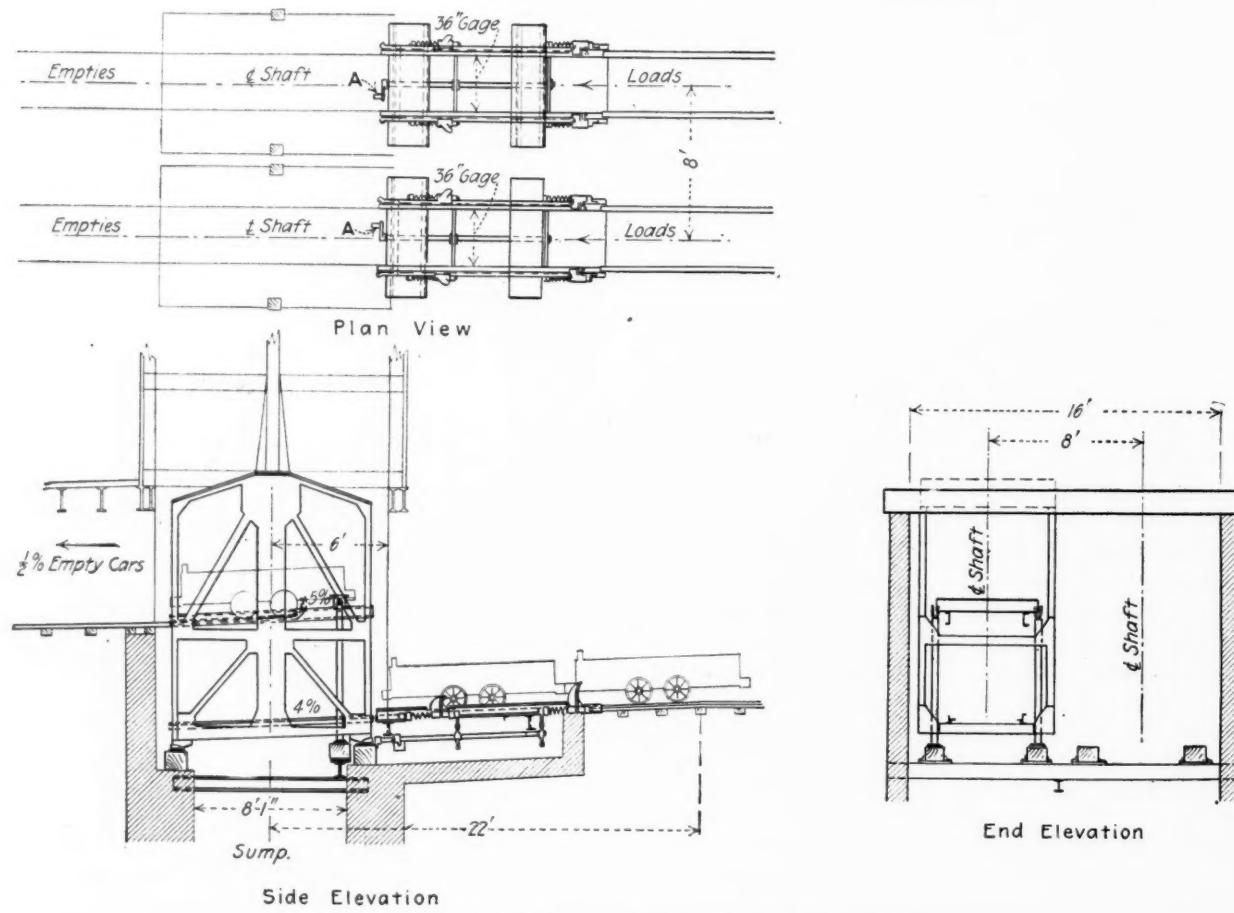


FIG. 1. SHAFT BOTTOM, SHOWING AUTOMATIC SPOTTERS

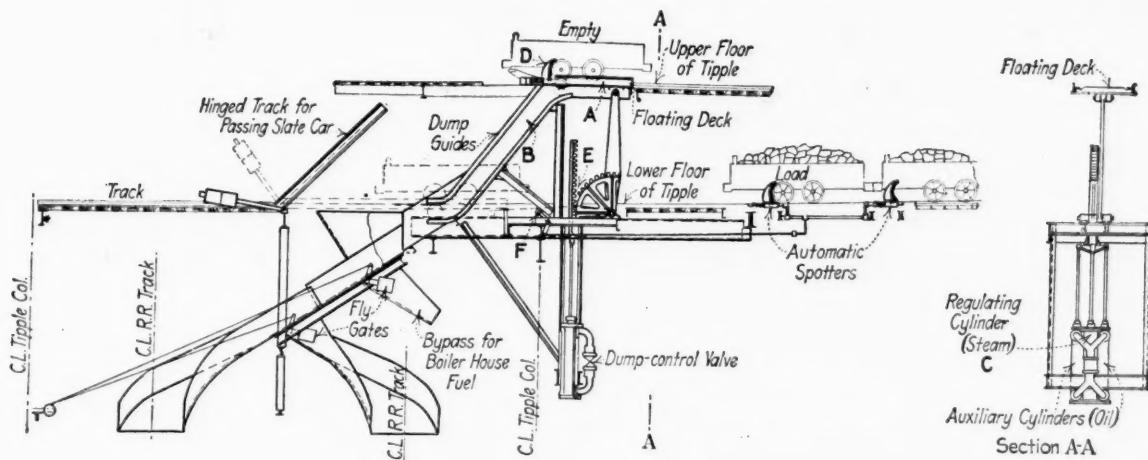


FIG. 2. THE POWER DUMP, SPOTTERS AND COAL CHUTES

grade of "B" vein coal. The shaft is built in four compartments, two for the coal hoists, one for supplies and one for the pipes and various conduits. The horizontal dimensions are 12x24 ft.

The trip of loads stands on a grade at the bottom of the shaft and is admitted one car at a time to the lower deck of the cage by an automatic car spotter. This consists of two pairs of horns attached to rocker shafts, so arranged that when one set is in the other set is thrown out, and vice versa. Each of the horns is equipped with a spiral spring to relieve the shock incident to the car coming into engagement. The spotter is provided with a lever mechanism, shown at A, Fig. 1, which is worked by the cage

so that the operation of the car spotter is absolutely controlled by the cage itself. The loaded car runs onto the lower deck of the cage, which is inclined on an angle of 4 per cent. and is provided with a pair of spring horns for holding the car in position.

The cages are constructed entirely of steel. The lower deck is rigid with the slope in the direction of the loaded-car track. This deck is for handling loaded cars only. The upper deck is located 5 ft. above the lower and is adjustable. In its normal position this deck has an inclination of a little more than 2 per cent. in the opposite direction from the inclination of the lower deck, and is equipped with a set of rigid horns.

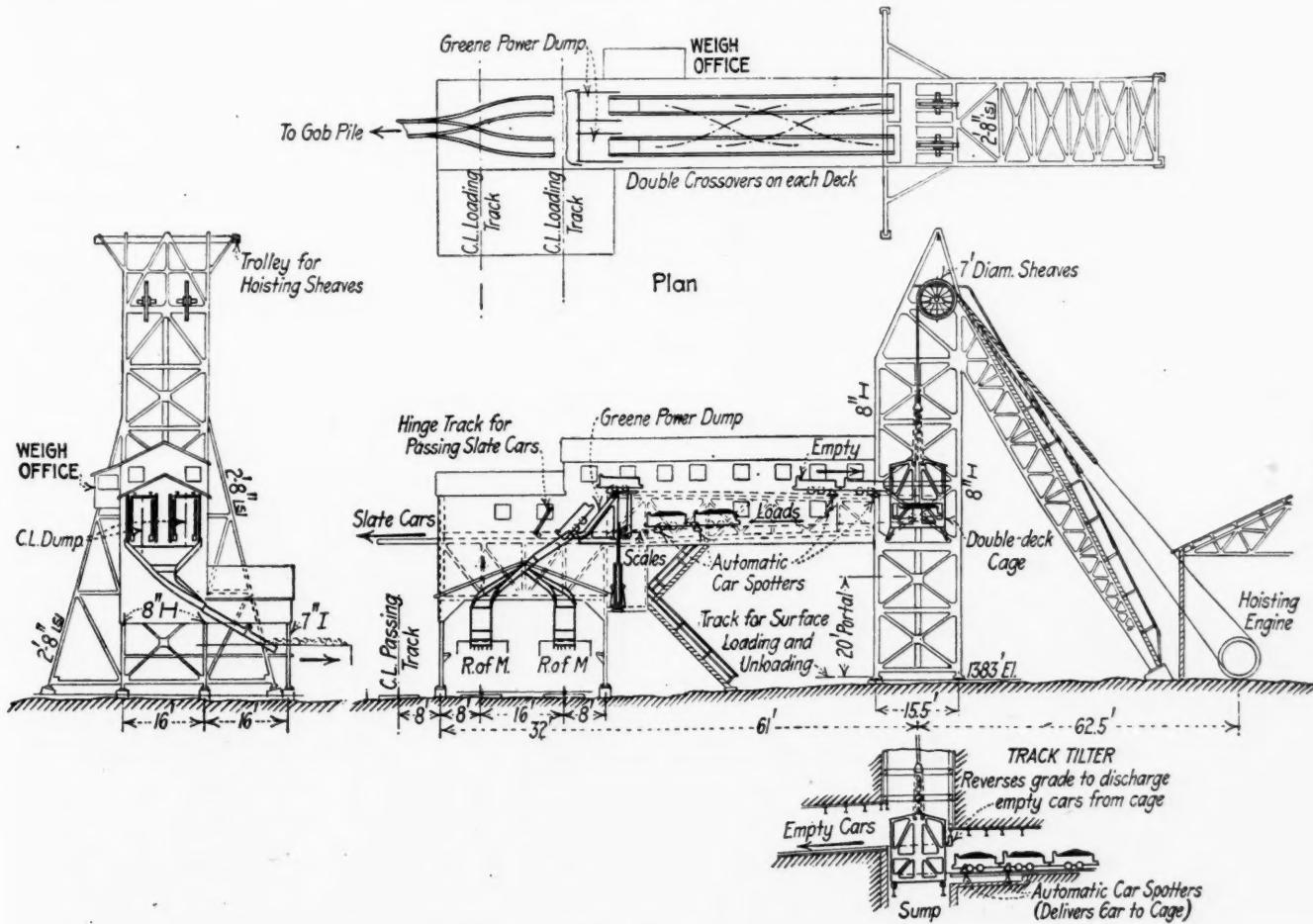


FIG. 3. GENERAL ARRANGEMENT OF TIPPLE AND SHAFT

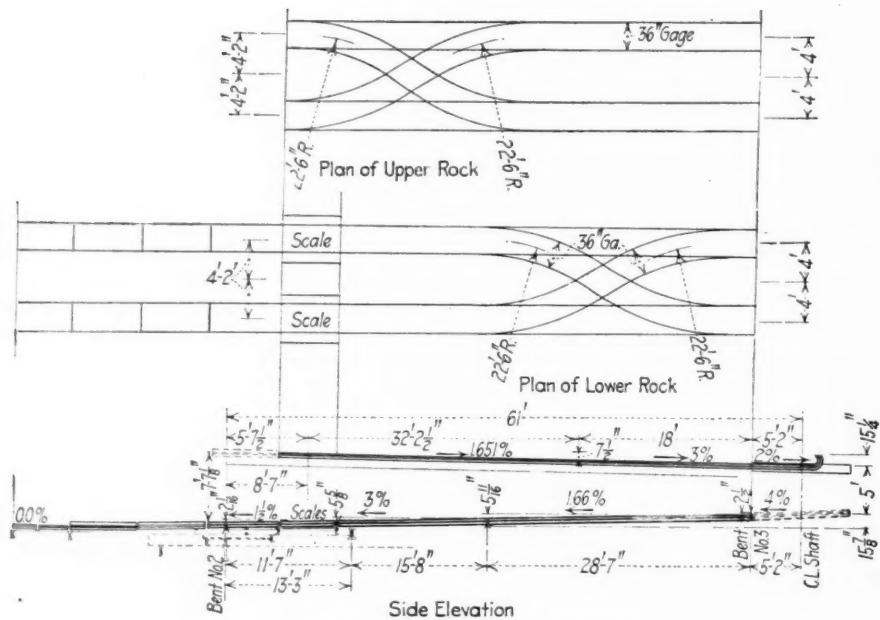


FIG. 4. TRACK LAYOUT ON THE TIPPLE

The cage is provided with drawhead and double safety catches; also a set of drawhead bolts and shackle chain. All mechanical parts are either forgings or steel castings. The hoisting ropes are $1\frac{1}{4}$ in. in diameter and run over 7-ft. diameter wrought-iron spoke sheaves. These sheaves are mounted on 6-in. diameter axles that run in $5\frac{1}{2}$ x $11\frac{1}{2}$ -in. babbitt journal boxes provided with adjustable sole plates.

As the cage comes to rest on the keeps at the top of the shaft the horns that hold the loaded car on the lower deck are automatically thrown out and the car runs down its 4 per cent. grade onto the tipple floor. This grade changes immediately to 1.66 per cent. for a distance of 28 ft. For a short distance from this point, the car receives another start on a 3 per cent. grade and is then slowed up by a $1\frac{1}{2}$ per cent. grade as it crosses the scales and enters the spotters in front of the dump.

The weighing is done "on the run" by "Standard" 5-ton track scales. The matter of grades was given special attention, since if the operation were to be successfully automatic there would be no excuse for a boy to push the cars along the tipple.

After weighing, the cars run into a set of automatic spotters that are the same as those at the bottom of the shaft, except that these are operated entirely by the power dump itself through a crank and lever shown at *F*, Fig. 2. Here as well as at the bottom of the shaft the cars are fed automatically. It is not even necessary to have a workman watching them. The cars wait their turn on a grade and are released when the cage, or dump, comes into position by the automatic swinging horns known as "spotters." The "Greene" patented power dump is the machine that permits of the double-deck tipple. This may be described briefly as follows: The function of the dump is to take a loaded mine car from the lower runway tracks of the tipple, dump it and transfer the empty car to the upper runway. It has three essential parts; namely, a floating track section *A*, Fig. 2, a set of guides *B* and a steam cylinder *C*, which is supplied with a governing device in the shape of two auxiliary oil cylinders placed either side of the regulating cylinder. There are no counterweights. A shock absorber is provided, forming part of the floating track section. This engages the front wheels of the loaded car *D*, Fig. 2.

Starting with the floating track section in its normal position in register with the lower runway tracks, a loaded car runs onto the dump. (With floating track section in its normal position, the actuating piston is at the bottom of its cylinder.) The loaded car having engaged the horns, the operator lets steam into the bottom part of the cylinder, causing the piston to travel upward. This movement is transferred to the floating deck section through the rack and gear segment shown at *E*, Fig. 2, and the lever *B*, causing the rear end of the floating track section to rise. As this rises, the loaded car is tilted to an inclination of 60 deg., providing the dumping action.

The regulating cylinder, with its auxiliary oil cylinder governors, controls the dumping of the car absolutely, providing a smooth, steady movement, fast or slow at the

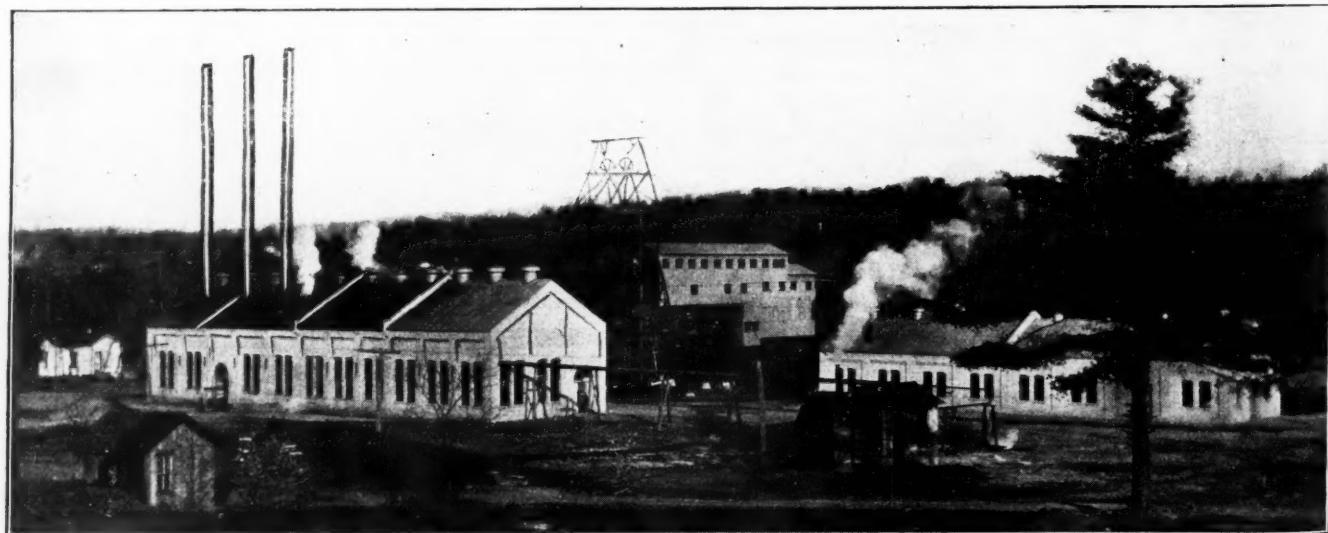


FIG. 5. GENERAL VIEW OF SURFACE EQUIPMENT

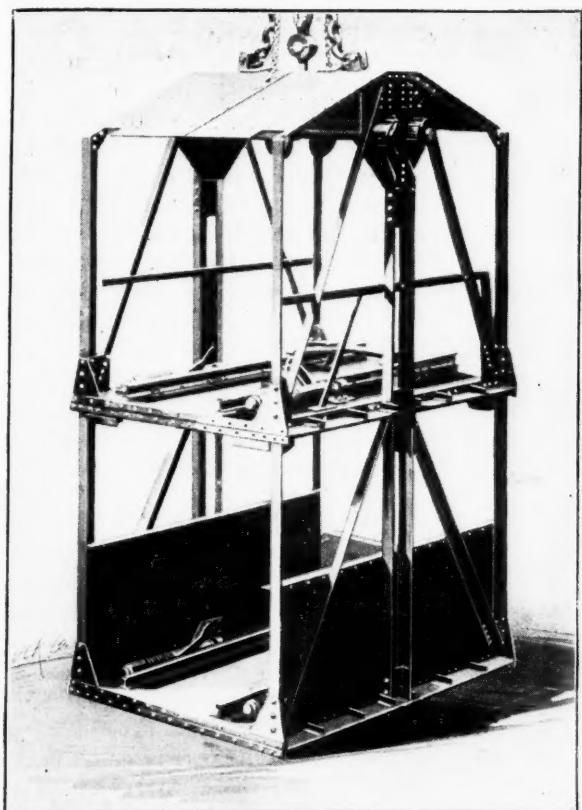


FIG. 6. THE DOUBLE-DECKED STEEL CAGE

will of the operator; or the car can be joggled if need be. The auxiliary oil cylinders have cross-connected bypass pipes, with a single valve for regulating the flow of oil from one part of the cylinders to the other. They govern the speed of dumping and transferring by impeding the action of the steam regulating cylinder.

The car being discharged, the floating track section with the car travels upward, under the influence of the steam cylinder, until it registers with the upper track.

The shock absorber springs, having been under compression all this time, extend themselves. The resultant push applied to the car, together with the favorable grade on the floating section, causes a rapid emergence of the empty car onto the upper runway.

The floating track section being empty, the dumper allows the steam to exhaust from the regulating cylinder, permitting this section to drop into register with the lower runway, just reversing the cycle of upward movements in

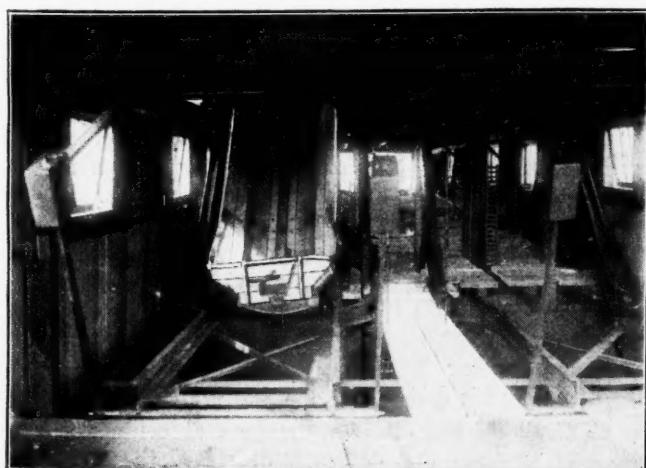


FIG. 7. CAR IN DUMPING POSITION IN TIPPLE

dumping and transferring. The drop of the floating track section is cushioned by the regulating cylinder and takes place fast or slow at the will of the dumper.

As the empty car leaves the dump it runs by gravity to take its place in front of the shaft. It is fed onto the cage by another set of spotters that feed the cars one at a time to the upper cage deck.

The equipment of the tipple consists of two complete duplicate units; that is, there are two cages, two dumps and two sets of upper and lower tracks. The dump is placed about 50 ft. from the shaft, and the track layout on the two floors of the tipple is such that all the cars can be run to either dump or cage.

As the cage drops to the bottom of the shaft it is automatically pitched to a grade of 5 per cent. in the same direction as the inclination of the lower deck, and the empty car is shot out and carried by gravity to a side track. Sidings with a capacity of 200 empty cars have been provided at the foot of the shaft.

In connection with the transfer dumps there is one chute constructed of $\frac{1}{4}$ -in. steel plates of sufficient width at the top to receive the coal from both dumps. This terminates at the lower end in a pair of curved chutes



FIG. 8. SIDE VIEW OF TIPPLE AND HEADFRAME

with a flygate leading to the two loading tracks. At the end of each of these curved chutes is a hinged loading chute in two sections, each section being provided with loading fingers of forged steel. There is also provided a bypass chute for diverting coal to a crusher. Coal thus diverted is used under the mine's own boilers. One man below on the railroad cars operates the chutes.

The output of this operation is all run-of-mine, and when working at top speed the tipple can handle four cars per minute over each dump.

The headframe and tipple are entirely of steel construction, excepting the floors. All members in the headframe are designed with sufficient strength to break the $1\frac{1}{4}$ -in. hoisting cable without being stressed beyond the elastic limit of the steel. The sides and roof of the tipple are covered with asbestos-protected metal.

The rest of the plant consists of two other buildings of brick and steel covered with asbestos-protected metal. One building, 160 ft. long and 42 ft. wide, houses the boilers, hoisting engine and electrical equipment. The other, 120 ft. long and 30 ft. wide, contains the electrical repair shops, car repair shops, machine shop and the blacksmith shop.

The tipple equipment was designed and built by the C. O. Bartlett & Snow Co., of Cleveland, Ohio.

Coal Mining Institute Meeting

By R. DAWSON HALL

SYNOPSIS—A well attended and interesting meeting. Van H. Manning, director of the Bureau of Mines, advocates co-operation, this principle for the regulation of the coal industry having the approval of the Department of the Interior. Animated discussion on electric safety cap lamps and acetylene lamps.

The Coal Mining Institute of America on Dec. 6 and 7 held an enthusiastic meeting at the Fort Pitt Hotel, Pittsburgh, Penn., at which perhaps more people were present than at any previous gathering of the organization. It seems to be a good year for institutes. The interest in mining problems appears to be increasing rapidly. Despite the anticipation of the executive committee that everybody would be too busy to attend, it proved that few were so busy that they could not find time to be present.

As soon as the session of Dec. 6 opened, a new president was elected for 1917, the honor falling to William L. Affelder, general manager of the Bessemer Coke Co., of Pittsburgh, Penn. H. D. Mason, formerly with the Bureau of Mines, and now one of the engineers of the Mine Safety Appliances Co., was unanimously elected secretary-treasurer.

The following persons were presented for the vice-presidencies, the number of votes each received following the name: W. E. Fohl, 41; Dr. W. R. Crane, 24; F. W. Cunningham, 21; C. P. Byrne, 19; S. A. Taylor, 15; Alexander McCanch, 14. The first three were declared elected. The executive board was completed by the election unopposed of S. A. Taylor, Alexander McCanch, C. P. Byrne and John I. Pratt. The tellers were E. M. Chance, T. A. Furniss and Joseph Williams.

CONDITION OF LABOR SUPPLY AFTER THE WAR

After this election the president, Joseph Knapper, read his address, a copy of which, somewhat shortened, appeared in *Coal Age* of Dec. 9, pp. 967 and 968. The president, who was acting as chairman, gave the members no chance to discuss the propositions he advanced, even though he declared them somewhat bold and that he had submitted them for the purpose of provoking discussion. No sooner had he finished his paper, than he called on W. E. Fohl to open the question box.

The first question was:

What will be the condition of our labor supply after the conclusion of the great war?

State Inspector T. K. Adams, of Mercier, declared that after the war, provided the miners worked for a full eight hours, there would be plenty of labor to meet all the possible demands of the mining industry. He anticipated that the men who had recently left the mines would find their way back when the war came to an end. He believed that foreign labor would come here, attracted by our higher wages. In Europe there will also be plenty of labor, for the women who have entered gainful occupations will not readily be dispossessed. The men, when released from service, will find that women are in industry to stay and that they will have to compete with them.

State Inspector F. W. Cunningham, of Somerset, declared that the main problem was rather what business would remain after the war. But confining his remarks to the labor supply, he said that his inquiries led him to think that in his district many Austrians and Germans would return to their native countries and the Italians and Russians would not even go back to visit. The Italians especially fear that if they return they will have to pay heavy taxes on what they have earned in America. He did not anticipate that Europe will have any men to send to us after the war is over. They will need all they have to replace what has been destroyed.

EFFECT OF VODKA ON NATIONAL EFFICIENCY

In reply to a statement by another member that borrowing nations like Russia and Italy would be the greatest sufferers from the war, S. A. Taylor declared that in his estimation Russia would do well when the war was over. Its losses appear large, but Russia has 75,000,000 men on which to draw. He instanced one coal mine to show how temperance is going to do in Russia far more than the war could ever undo. At this mine 60 per cent. of the men were drafted into the army. Two or three weeks later, by hiring new men, the percentage of men employed had increased so that the mine had 50 per cent. of its normal force. But by reason of the abolition of *vodka*, this half force was enabled to do as much as the full force had previously done. At first they worked not only every day but on Sundays also. Later the men refused to work on Sundays, but they nevertheless produced as much in a week as had the full force before the war.

R. B. Foster declared that the American people could hope to hold their own only by training men in efficiency at corporational schools. He said that Germany had prepared for the present war for 40 years. At the end of one year of fighting, Germany had used up the supplies she had gathered by long diligence and had to fight wholly on her momentary productivity. This she succeeded in doing with hardly any outside help, because of the excellent vocational training of the men in her industries.

ARE OUR MINERS BECOMING MORE EFFICIENT?

W. L. Affelder declared that his men were more efficient than ever before. He thought that even if the present demand for coal continues, the mines will be able to meet it fully, even if we have less men. He said that there was a markedly increased production per man in the last two years, largely due to increased mechanical efficiency.

Referring to the need for greater efficiency and the means and possibility of increasing it, S. A. Taylor stated that he was planning a new bonus system at a recently opened mine. He figured what material and repairs normally cost him. Any saving from these normal production costs it was his purpose to divide with the men.

State Inspector Nicholas Evans, of Johnstown, declared that in his district no one had noticed any greater efficiency in labor. In fact the general complaint was that increased demand had only decreased the ability or the readiness of the miner to produce a good tonnage.

The next question presented for discussion was:

Should rescue and recovery be performed by people in the employ of individual companies or by men in the employ of the Federal Government?

State Inspector T. K. Adams declared that the state mine inspectors and the Federal service should advise and help in the work of rescue, but that they should not take charge.

E. M. Chance, consulting chemist, of Philadelphia, said that the mine inspectors are too old for breathing-apparatus service. The best men for that work are those who are about 25 years of age, and the mine inspectors are and should be men older and with more experience. The inspectors should advise the officials of the company in case of a disaster; the Bureau of Mines officials could supply training to the companies' instructors, but the companies' own men should perform the actual work of rescue.

The question that followed,

What is the best method of training the men in the ranks to fill official positions in mines?

met with little response. W. L. Affelder stated that he was not much disposed to train his own men, as almost invariably men so trained were discontent with the speed of promotion, and usually left the operator in the lurch long before the training had been completed.

Equally unproductive of argument was the question:

Should rescue or first-aid training be required as a requisite for the position of mine foreman or fireboss?

But some discussion greeted the next question:

Is preservation of timber a profitable investment?

Dr. Crane urged that the value of timber preservatives has been convincingly shown by the experiments of the forestry service and the railroads. He added that in some metal mines it had been found that where timber was long buried it became incombustible, the salts rendering the fibers uninflammable.

CREOSOTED TIMBER DID NOT BURN IN MINE FIRE

E. M. Chance said that at one plant where the sodium chloride and zinc chloride treatment was used, the timber treated had not yet failed, though some of it is nine years old. Yet in these same places untreated timber will last only five or six months. He added that the company operating this plant was apprehensive that if used in the mine creosoted timber might catch fire and cause a disastrous conflagration. One day a slope in which creosoted timbers had been alternated with untreated timbers caught fire. This slope was 700 ft. long and had a pitch of 40 deg. The fire was a severe one, but the company, fortunately, was able to shut the air off the fire, and it eventually smothered itself out.

When an inspection was made, it was found that the untreated timbers were burned so severely that they had fallen, but that the creosoted timbers were only charred and were standing and holding up the load. The mine officials decided that the creosote had burned, but had nevertheless saved the timber, because the wood acted as a wick, which merely feeds the more combustible material to the flame but does not itself burn. As soon as the air was cut off, the creosote was extinguished, and the wood, not being really on fire, did not have to be put out. But the untreated timber was glowing, and a slow combustion of this material continued long after the air feed came to an end.

W. L. Affelder said that about two years ago he erected a tipple, partly of steel and partly of timber. He covered the latter with two brush-coats of carbolineum. A new tipple he has just built has been treated with the same preservative, but this time the material has been dipped in carbolineum and has not been merely brush-coated. He expected in future to treat all tipple timbers in like manner. It was especially desirable for the timber in bins, because when these are in continuous use the timber soon rots.

A. B. Franks, of the H. C. Frick Coke Co., advocated the use of a preliminary vacuum in creosoting, declaring that mere brush-coating and dipping without a vacuum would never provide the necessary penetration and so treat the entire timber. For use where the track timber was repeatedly giving out, he had creosoted ties under steam pressure. He believed he got somewhat better results than with untreated material, but the ties did not last, for the treatment was only local. The sap remained inside the stick and when it dry-rotted only a shell of solid timber remained, which did not serve the purpose demanded of it.

Sion B. Smith said that with proper treatment red oak and chestnut can be made of equal value to white oak, but white oak is too dense to take treatment properly.

DISAGREE AS TO DEFINITION OF GASEOUS MINE

The question that next came up for discussion was:
What is a gaseous mine?

Greeted with a laugh, this was discussed in a somewhat uncertain way, some members regarding it from a natural and some from a legal standpoint, and others, perhaps without knowing it, getting the state law mixed with the canons of the state board of compensation and of the Associated Companies.

Thomas B. Lowther said that any mine which had firebosses was rated by the department as a gaseous mine. David Young, the state inspector at Freeport, defined it as any mine which has generated gas in the last two or three years.

T. K. Adams said that any mine where gas can be detected with an approved safety lamp is a gaseous mine. When so detected the gas must be watched by firebosses for two or three years, in the manner appointed by the law. Then, if they do not find gas, the mines may be run without firebosses, as the mine would then be demonstrated as not being gaseous. He said he would prefer to arrange to make his test for gas in the mine when the part under suspicion had not been recently ventilated, because the failure to find gas in a ventilated place was probably more a measure of the efficiency of the ventilation than of the real dangers of the place, should anything go wrong with the ventilation or any carelessness, momentary or otherwise, be shown. "But all this," he added, "is only my preference in the matter. The law would not sustain me in making an inspection in this manner to determine whether a mine is gaseous, because the part of the mine tested would not be in a normal condition." He said he would not try to enforce the law as regards its provisions against gas if its presence could only be determined in the manner just stated, but he might urge upon the operator that the introduction of firebosses was a moral obligation.

Mr. Duncan, of the Associated Companies, then declared a gaseous mine was one where gas could be de-

tected by an approved safety lamp in a place where the ventilation had been stopped for four hours when the light is held 6 ft. from the working face and 1 ft. from the roof in the center of the working place and not in front of any blower. Mr. Duncan declared this a part of the law of 1913, but Nicholas Evans, a state mine inspector, said there was no such enactment. T. K. Adams, another state mine inspector, also denied that the statutes required or suggested any such test. Later, W. H. Cunningham, another inspector, declared that even the word "approved" was not used in relation to the type of safety lamp to be used in the testing for gas, but that the word "improved" was used in that connection. David Young, also an inspector, said that the word "approved," which he declared part of the law, meant "approved by the Department of Mines"; but T. K. Adams declared that he believed that "improved," which undoubtedly appeared in the actual statute, was a misprint for "approved," which was doubtless what the legislature had in mind.

A discussion arose meanwhile as to what percentage could be detected with such lamps as were in use in the mines. Mr. Ryan, of the Mine Safety Appliances Co., said some men could detect three-fourths of 1 per cent., but could not do so with any real certainty, and that with some lamps the lowest determination possible was about 1½ per cent. Dr. Crane, of State College, said that the law should not require that the determination be made with a safety lamp, but with some reliable gas-testing apparatus, because the safety lamp was dependent on two uncertain factors—the personal equation of the man making the test and the presence or absence of other gas than methane which would dampen the flame.

Mr. Duncan advocated the use of the Burrell indicator, and said that the test he had described should preferably be made with that instrument instead of with a safety lamp. Then if ½ per cent. of gas was found, the mine should be considered gaseous.

DANGER SIGNS USED WITHOUT DISCRIMINATION

The question next presented for consideration,

When, where and under what conditions should the danger signal be used in and around the mines?

received more lengthy consideration, it being the opinion that some of the operators used the danger signal entirely too freely. It has come to be regarded merely as the green light on railroads that warns the trainmen not of the certainty but only of the possibility of danger. Operators have tacked these danger signs even onto the mine entrances. If the mine is dangerous enough to merit the use of such a signal on the drift mouth, then it is so dangerous that no one should enter it except to remove the danger.

Mr. Duncan said the danger sign should only be used where no one is allowed to go except some one who is deputed to make the place safe. Where a danger can be removed, it should be removed and no sign set.

Thomas A. Mather, a state mine inspector at Tyrone, deplored the great number of danger signs used and said their multiplicity caused accidents. The Pennsylvania danger signs should only be used where a penalty could be rightly imposed for passing them. Men leaving a place where signs are tacked up without any discrimination and coming to a mine where the hazards are greater and the signs are used with due discrimination, are quite

likely to pay no attention to them, and accidents will occur.

W. E. Fohl jocularly inquired whether it was permissible to hang up a danger sign at the mouth of a place temporarily abandoned to prevent the miners who were short of mine rails from going in and carrying away the tracks.

The next question was,

How can a mine explode when there are no men in it?

David Young, state mine inspector, declared that his experience in such mysterious explosions related to a mine of the McFetridge Brothers Coal Co., which suddenly exploded six or seven years ago at 9 o'clock one Sunday morning. The mine was highly gaseous, and when the fan was running was kept free of gas by a current of 17,000 cu.ft. of air per minute. Permissible explosives were used, the shots being fired by shotfirers. When the examination was made, no one could be found in the mine. The search for entombed men was most painstakingly pursued, for Mr. Young could not believe for a long time that the mine had been empty when the explosion happened.

EXPLOSIONS WITHOUT MEN OR ELECTRIC CURRENT

He remarked to the institute that it could not have been due to an electric current, for there was no electric wire in the mine. The fan had been closed down for repairs the night before the explosion. Prior to this a man had been in and fired a shot. After his investigation, Mr. Young concluded that the shot had ignited a feeder. The closing down of the fan caused the gas to accumulate. When, due to the suspension of ventilation, the gas in the neighborhood of the flame reached the proper percentage for ignition, it was ignited and caused a most violent explosion. This explanation he still believed to be the correct one.

E. W. Parker instanced the Colorado Fuel and Iron Co.'s Newcastle mine, which had an explosion 47 min. after the men left the workings. He said it was generally believed that the explosion was due to spontaneous ignition. The coal in this mine slacks rapidly, and the mine while working was always troubled with self-ignited mine fires.

W. L. Affelder said that it was generally believed that in Pennsylvania spontaneous ignition was impossible, but he had experienced such a fire in a part of a mine that had not been worked for about 10 years. One day a gob stink appeared in the mine, and sure enough a fire was found in the old workings. It had already made much progress.

Inspector Thomas A. Furniss related the circumstances attending the recent Eleanora shaft explosion, which occurred in a mine in which no men were present. It was a gaseous mine and the recognized precautions were taken. Only permissible powder was used, shotfirers fired all shots, and the lighting was entirely with locked safety lamps. It was generally accepted that the cause of the explosion was a fall of roof, which in its turn caused a short-circuit of the electric current. In fact, a fuse was blown out, and this indication supports the suggestion that the grounding of the current actually occurred. The fan was shut down, the mine having been idle for a week.

Elias Phillips, another state mine inspector, said that there was an electric pump in the Eleanora mine and it was necessary to supply it with power, and that the fall

of the wires leading to the pump may have been the cause of the explosion. Another speaker said there appeared to be two foci of violence, and that there may have been a second explosion resulting when the current was reestablished by the throwing-in of the circuit-breaker. The explosion was an extremely severe one, coke $\frac{1}{2}$ in. thick being formed in places.

Rufus Foster, of the International Correspondence Schools, declared that at a colliery in Schuylkill County in the anthracite region lightning ran along the rail to the face of the mine. No explosion followed, but there would have been one had gas been present. Elias Phillips stated that the first Adrian explosion, to which someone called attention, was directly due to the firing of a shot. The men had lighted it and left the mine. When it went off the mine blew up.

Joseph Knapper recalled an experience that showed that mines were quite liable to explode from causes entirely apart from the presence of men in the mine. He said that when the Shaw gas tester was first introduced, a pipe was installed at a certain mine to bring samples of gas to the surface for testing with that instrument. On one occasion a miner when working round the pipe received a shock that downed him. There was no electric conductor or trolley wire anywhere in the mine, and the current must have come from the public electric service which was provided in the neighborhood of the plant. In consequence, the coal company concluded that a dangerous return existed in their mine and that it was safer to remove the pipes, and they did so.

Asked whether an explosion could occur from a fall of rock on detonators, J. J. Rutledge, of the United States Bureau of Mines, declared that it was quite possible. A member of the institute then mentioned the explosion in the Bellevue Colliery, Canada, and another in a mine in the Rhonnda Valley, South Wales, both of which had been ascribed to the fall of siliceous rock on a hard floor in the presence of gas, no men being present at the time.

The next question taken from the question box was:

To what extent has the cutting-and-loading machine been developed?

Mr. Weldin stated that at Annabelle last year two machines had worked 200 days and driven 6,000 ft. of entry in safety through coal where the roof conditions would have made heading driving by ordinary methods dangerous.

INVERTED SIPHON TOO FREQUENTLY OVERLOOKED

The latter part of the afternoon session was taken up by the reading of two papers, one of which was on "Permissible Explosives," by F. H. Gunsolus, manager of the technical division of E. I. du Pont de Nemours & Co., Wilmington, Del., who was, however, unable to be present in person. L. B. Smith, mining engineer, of the Morrisdale Coal Co. in the Clearfield region, then read an interesting article on "Handling Mine Water," which will appear in an early issue. The large amount of water to be handled in that district has made necessary the use of many and large inverted siphons. Perhaps few companies have understood as well as the Morrisdale people the possibilities these arrangements offer.

We fuss and fume over real siphons with almost hourly troubles in the services they render, when perhaps we should abolish them and use a pump. But we overlook frequently the chance to use an inverted siphon which

will never give any trouble, for it does not depend on a vacuum but on positive pressure. Nothing can ever happen to it but silting and corrosion. It never gives as much trouble as a pump. The device deserves more consideration than it receives.

The only reason for the lengthy discussions in the technical press on the true siphon are its complications and unsatisfactory service. Because the inverted siphon is so simple and so certain in its action, it is largely overlooked. We run the water down into the lowest place in the mine and then at much trouble and expense we pump it out of that place into which, in many cases, it should never have gone. A pipe conveying that water from the high place through all the intermediate low places to a point of discharge higher than the lower levels passed, but lower than the point of supply, would give service such as no pump manufactured or imagined could equal.

A large pipe line from the Portage mines now passes along the workings of the Morrisdale mines, and the water flows by gravity up a shaft and out to the surface. A deep ditch has been dug to lower the level of the outflow and thus increase the speed of the water. In this way much of the water in the Portage workings is removed without pumpage cost, and the Morrisdale workings are freed from this water. If all this large body of water was allowed to find the lowest mine level before it was handled, the cost of pumping or hoisting it would be considerable. Mining engineers have never given the possibilities of the inverted siphon the attention they deserve.

MANNING URGES COÖPERATION AMONG OPERATORS

The institute dinner was attended by about 110 persons. An address entitled "Federal Aid to the Coal-Mining Industry" was read by Director Van H. Manning. It fully sustained his reputation as a writer of forceful English and a clear thinker, and yet the address, excellent as it was, would not have occasioned much remark had it come from a man not connected with the Government service.

The last part of the address dealt with coöperation, about which there is little more to be said than has been said already. What we are looking for are governmental ratifications of the generally recognized demand for coöperation. These V. H. Manning supplied.

E. N. Hurley, chairman of the Federal Trade Commission, at the American Mining Congress said that he would advocate coöperation if correct cost accounting appeared likely to fail in removing present abuses. Manning made no such reservation. He advocated coöperation and said that Secretary Franklin K. Lane, the head of the Department of the Interior, was in sympathy with the ideas he expressed.

So this after-dinner speech really advanced matters quite measurably in a way in which after-dinner speeches rarely do. The United States Bureau of Mines, under the late J. A. Holmes, always declared that the coal industry was run almost without profit and therefore often riskily for the miner, wastefully as regards mineral resources and uncharitably in the matter of sociological provision. But he largely stopped at that point in his declarations, if not in his private opinions. This speech supplies us with the whole matter. Not only with the argument but with its conclusion also.

After the speech of Mr. Manning the diners heard from E. W. Parker, the director of the Bureau of Anthracite Statistics, from J. F. Callbreath, secretary of the

American Mining Congress, and from S. A. Taylor, all three speaking along the same lines. But the argument for coöperation is merely the opening bombardment; it is Governmental action which alone takes the trenches.

S. A. Taylor's remarks had reference to the successful work of the various coal associations recently formed, especially the notable success of the Franklin County Coal Association in Illinois. Some remarks by R. D. Hall on the seasonal and runaway markets, and the means of controlling them wound up the speech making. The toastmaster at the meeting was W. L. Affelder. Sandwiched between the speeches moving pictures of an anthracite mine and of some "daylight mining" in the open pits of the Ellsworth-Klaner Construction Co. were projected onto the screen.

The morning session of Dec. 7 opened with the reading of a paper on "Mine Accidents," by Nicholas Evans, state mine inspector at Johnstown, Joseph Knapper being in the chair. The discussion drifted at once to danger signs, which seemed to be in most people's minds. E. M. Chance, after saying that they were used altogether too promiscuously, said that some people seemed to think that a danger labeled was a danger removed. Elias Phillips declared that he thought there were not enough danger signs used. They should be placed at all points of approach to dangerous places. The trouble was not so much with the number of signs used, but with the poor judgment displayed in their placing. There were not too many of them, but those there were, were often ill placed.

DANGER SIGNS USED FOR SINISTER PURPOSES

As for the putting of danger signs on abandoned places so as to prevent the miners from removing the rails, as suggested the day before by W. E. Fohl, he strongly condemned such a misuse of danger signals. He had recently had a case of a similar kind. A place in the mine was stopped, and without waiting for the man to get his tools, the foreman ordered a danger sign erected at the room mouth. Then he had the man arrested because he went in to get his equipment. Phillips said he was more disposed in this instance to bring action against the mine foreman for wilfully misusing a danger board than against the miner for disregarding it. The foreman knew the place was not dangerous and should not have placed the sign.

Another speaker said that dangers which were merely contingent should not be guarded by a danger sign. He said he had in his mine a slope down which cars were lowered and up which they were hoisted. Some men had to pass across this track, but he considered that a regulation danger sign was inappropriate at this place, for the danger was not inherent in the place but would exist only when cars were passing. It was not the intention to remove that danger altogether nor to forbid men to pass. It was therefore the wrong place to put the danger sign which the Department of Mines specified. At such a point the word "Danger," followed by "Beware of the Cars," was what was really needed.

Joseph Knapper said that danger signs of the standard type should only be placed where a removable danger has not yet been removed. One operator had a narrow roadway along which mules were hauling and men passing. He had the regulation shelter holes provided in which men could retreat when the trips passed. In these

he set up danger signs. Now these signs were designed to keep men out of dangerous places, yet they were apparently erected in this place to invite men into safe places and out of danger. This was clearly a misuse of the sign and liable to lead to its character being misapprehended.

State Inspector Girod, of Masontown, said that danger signs should be placed at the mouths of abandoned rooms because there was no need to enter them; and as they were not inspected, no one knew in what condition they would be should any one travel along them.

W. L. Affelder said even this rule could be carried too far. Some mine inspectors had ordered him to put danger signs on abandoned rooms which had fallen shut to such an extent that no one could possibly enter them beyond the neck.

John I. Pratt recounted an instance where a regulation danger sign was placed on a room in order to compel a man to come out who had loaded dirty coal. No danger had been reported in this working place. J. J. Rutledge, of the Bureau of Mines, said that in the Southwest the XXX dead line was never passed, the penalty of passing it being \$50 fine and 30 days' imprisonment. Danger signs will be of value only if rules are strictly enforced.

E. M. Chance declared that the only safe practice in a gaseous mine was to remove the gas. Nonsparking machinery, no matter how protected, was not safe as sparks were often made mechanically in the cutting of the coal, and there were other possible causes of ignition. The only safe way was to remove the gas. Many of the precautions now existing gave a false security which made men disposed to be careless.

W. R. Crane said that the working man was not doing his part in the safety movement. He recalled that R. H. Harlin, international board member from Washington, while admitting at the American Mining Congress that the miners were mostly to blame for accidents, declared that the United Mine Workers of America would not do anything to promote safety till the operators had done all that lay within their power to assure it. He thought that the obligation to keep down the number of accidents was as incumbent on one as on the other.

INTERESTING DISCUSSION ON MINE LIGHTING

J. T. Jennings' paper on the "History and Development of the Electric Mine Safety Lamp" was then read by W. L. Affelder. Jennings, who is electrical engineer for the Philadelphia & Reading Coal and Iron Co., at Pottsville, Penn., detailed the excellent work of that company in assisting the various manufacturers of safety cap lamps to develop their product for general use. Had it not been for the work and encouragement of that company it is probable that the cap lamp would not have arrived at its present state of perfection for many years. It is true that the Bureau of Mines made many tests and suggested many improvements, but practical experience and an assurance of market was needed to help the manufacturer and to encourage him to go on with his work. The interest of the Philadelphia & Reading Coal and Iron Co. furnished this impetus.

J. M. Armstrong said he had 14,000 lamps in operation. The batteries of those which have been longest in use have been operated without rebuilding for 21 to 22 months. He said the men were all well disposed toward the lamps and quite willing to use them.

W. L. Affelder said he was using Wolf safety lamps at one of his mines, but had replaced them with Edison electric cap lamps. At first he installed only 65, and he nearly had a strike on his hands because the rest of the men thought the 65 who had the cap lamps were being unduly favored. Wolf safety lamps were run for a total of 11,436 lamp shifts, and the cost of repair parts was 0.55c. per lamp shift. The naphtha cost was 0.73c., making a cost of 1.28c. per lamp shift. Of course, in this figure no account is taken of the cost of the labor used in caring for and delivering the lamps.

The cost of the electric cap lamps was 0.58c. per lamp shift for distilled water, repair parts and everything but labor. Thus by the introduction of the lamps a saving equal to the cost of the naphtha was introduced. Furthermore, the credits given in the insurance rating for the installation of the lamps practically balanced the cost of repairs. As a further advantage, the new lamps increased the efficiency and the output of the men. There is in this no consideration of the important matter of depreciation.

The men at another mine regarded the electric lamps even more favorably than they did the carbide lamps they had been using. They paid 5c. per shift for the electric lamps, but said that they saved money by the change as they would buy a carbide lamp nearly every month. Affelder declared that the electric cap lamp increased the efficiency of all the men, especially of the day men and machine men.

When asked why he changed from carbide to electric lamps, he said that when he took charge he found the mine was in a dangerous condition. He induced the men to give up smoking and to quit firing with squibs the permissible explosives they were using. They readily consented to the introduction of shotfirers. When a member declared the men "blessed saints" and not miners, he admitted it was a nonunion mine in which these changes which increased the safety and bettered the condition of the men were so readily introduced.

RELATIVE ILLUMINATIVE VALUE OF MINERS' LAMPS

E. M. Chance said that the electric cap lamp had distinct advantages over the old types of safety lamps, but it did not give as much light as the unprotected lamps. Thus the Davy gave 0.12 ep. the Clanny 0.45 ep., the Wolf 0.90 ep. over a spherical angle of 60 deg., whereas the electric cap lamp would give 1.50 ep. over a spherical angle of 130 deg. The oil torch gave 2 to 2.5 ep. and the acetylene lamp a spherical candlepower of 6 or 7. In the center of its beam a light of 30 or 40 ep. was generated.

He favored the use of acetylene lamps in nongaseous mines. They were more desirable in such workings than any electric lamp could ever be. However, he did not believe that drivers should be required to wear carbide lamps. He declared that the acetylene lamp can be operated for $2\frac{1}{4}$ to $2\frac{1}{2}$ c. per day for carbide. He believed that there should be specialization in lamps as well as in other things. The oil torch still has its place, so has the acetylene lamp, and certainly there is a proper and large place for the electric cap lamp.

The next paper, entitled "The First Year of Workmen's Compensation," presented by John Price Jackson, commissioner of the Department of Labor and Industry, was read by a representative of the compensation

department. It reviewed the history of workmen's compensation and proceeded to eulogize everyone connected with the state administration in a manner which disgusted everybody.

The paper by Robert T. Caldwell on the "Settlement for Mine Accidents Under the New Kentucky Workmen's Compensation Law," at the Louisville meeting of the Kentucky Mining Institute, shows the difference between the Kentucky board and that in Pennsylvania. The Kentuckian gave a really valuable paper, though of local interest only, and the only comment he had to make on the administration of the funds was a criticism on some trivial point. But other departments are not as modest as that over which Caldwell presides. It is time that institutes took a sterner hand to curb departmental advertising, which is just as offensive and far more gross than the advertising of manufacturers. Technical institutes need to watch the spellbinder who is always anxious to "put over" something in the interest of his political party.

But regardless of the valueless character of the paper, the discussion was interesting. In that discussion it was stated that the compensation board might easily be imposed on, as little investigation of claims was made, and the claims were paid not by the operator but by the state. One inspector said on one occasion he learned at a mine that a man's leg had been bruised. Soon after he received a report from the company that the man had lost his leg. He inquired of the superintendent as to the facts. The superintendent said that the man had certainly not lost his leg and that the coal company must have been misinformed.

It was pointed out that under the Pennsylvania system the company is not financially interested in the correct registering and compensating of accidents, nor even in their reduction. All the operator is anxious to do is to perform certain specific acts and put his mine in a certain specific condition, so as to lower his insurance costs. He is not at all interested financially in the success of all his safety provisions. Like Disraeli's little boy on the rocking horse, all he cares about is motion and not progress.

One insurance man present said that perhaps the workmen's compensation department and the Associated Companies would later consider the individual "experience" of the coal companies. This could not be done hitherto because the facts were not available. Hereafter they will be, and the moral and catastrophe rating may be based on the particular risk of any mine, company or district and not on the risks of some larger area.

E. E. Girod, state mine inspector, of Masontown, Penn., read an interesting paper on "General Mine Practice," in which the H. C. Frick Coke Co.'s concentration methods of mining were described and consideration given to the means of reducing accidents in mines. The article by C. M. Means, of the Randolph-Means Co., of Pittsburgh, followed. It was entitled "A New Electrical Device for Detecting Gas in Coal Mines." This paper was published in *Coal Age* in the issue of Dec. 16, pp. 1003 and 1004. Mr. Means in his discussion said the device if used with any reasonable care would work satisfactorily for an almost indefinite period. It would reveal one-half of 1 per cent. in the laboratory and about 2 per cent. under the mine conditions. At the close of the discussion the meeting adjourned *sine die*.

Kentucky Mining Institute Meets at Louisville

SYNOPSIS—A fair attendance and an interesting meeting. Ivan P. Tashof resigns as secretary and is replaced by Joseph W. Read. Addresses on electric-haulage wiring in mines, continuous coal cutters, coking and group associations for avoiding ruinous competition were delivered to the institute and discussed by the members.

The session opened at 2 p.m. on Friday, Dec. 8, at the Seelbach Hotel, Louisville, Ky. J. H. Buschemeyer, the mayor of Louisville, had his dates mixed and appeared in the morning to deliver his address of welcome. Consequently, in the afternoon, in the absence of the mayor, who could not be present, Frank Cassel of the Belknap Hardware Co., acting on behalf of the Board of Trade, welcomed the assembly. The first paper presented was on "Workmen's Compensation and Its Effect on Safety in Coal Mining." This was read by P. G. Elder, senior inspector for Kentucky of the Associated Companies, in the absence of E. C. Lee, chief inspector, of the same organization. It was practically identical with the paper prepared by H. M. Wilson, director of the department of safety and inspection, for the National Safety Council meet at Detroit, Mich. The gist of that paper appeared in *Coal Age*, in the issue of Oct. 2, pp. 672 and 673. Some of the members, especially F. P. Wright, general manager of the Crescent Coal Co. and past president of the institute, wanted to know to what degree safety had actually been increased by the operation of the workmen's compensation laws. Mr. Wright believed that nothing worth while would be done to reduce accidents till the personal responsibility of the mine worker for these accidents had been brought home to him. He said the law was without penalties. He would like to see the time when violations of safety rules would be penalized. It was pointed out by some of the members, including Prof. C. J. Norwood, that the law provided that the operator had the power to formulate any rules of safety he deemed requisite. These rules he could then submit to the state mining department, and such of them as were then approved when posted would become the rules of the mine. Violation of them would be a misdemeanor.

When it was suggested that juries would fail to convict, Assistant Inspector Joseph W. Read, of the Third, or Lexington, district, suggested that it might be better to test the possibility of obtaining a conviction from a jury than to assume that they would always disregard their duties and acquit the accused. The process of law, specified by the statute, was at least worthy of a trial.

H. D. Easton, general superintendent of the Federal Coal Co., Straight Creek, Ky., said that he was about to attempt to put the law in force in the courts. A fan runner sent a note to the foreman saying that he desired to be relieved of his duties. The foreman told him that he would put a man on the next day. The fanman then walked away and left the fan which it was his duty to watch. The Federal Coal Co. would attempt to obtain a conviction of this man.

Easton then added that he could not understand why the base rate in Pennsylvania is \$3.83 and in Kentucky \$4.24, for surely statistics showed that Kentucky is a state with fewer accidents. Professor Norwood said that the insurance companies had always put a rate on Ken-



SOME OF THE LEADERS AT THE LOUISVILLE MEETING

Left to Right, Top Row—J. E. Butler, K. Y. Meguire, H. M. Ernst. Lower Row—Ivan P. Tashof, E. Drennan, C. J. Norwood

tucky business higher than that placed against Ohio and Pennsylvania. When he protested and urged the excellent fatality record of his state the insurance men declared that the Kentucky juries, which gave such large verdicts for accidental injuries and fatalities, were the cause of this apparent discrimination. This was before the passage of the present act.

J. Rowland Brown's excellent paper on "Electric Haulage in Mines," with lantern slides then followed. It was one of the best presented and received close attention. H. M. Ernst, division superintendent, West Kentucky Coal Co., Sturgis, Ky., read a paper entitled "Results Obtained with Continuous Cutting Machines in Mines of West Kentucky Coal Co." This paper described the work of Sullivan coal cutters. Though the result

obtained at Sturgis, is good, even better results are said to have been secured under favoring circumstances.

J. M. Webb, of the United States Bureau of Mines, then gave a clever demonstration on first aid such as is shown at local meetings of mine workers. He went through the operations of dressing an injury of the head, a lacerated ear, a broken jaw, an injury on the point of the left shoulder, a burn on the breast and a fracture of the arm. He said that the bureau disapproved of the use of whisky as a stimulant and recommended the use of strong tea and coffee or aromatic spirits of ammonia. If whisky is given, it should be in small doses.

A discussion followed as to the possibility of maintaining interest in safety first in Kentucky mines, led by F. P. Wright. It appeared to be the general opinion that apart from the mines of the W. G. Duncan Coal Co., none of the Kentucky operations were able to maintain a continuous interest in the safety and first-aid movement. Among the speakers were W. G. Duncan, Jr., W. S. Wells and J. W. Read.

Reference to the eternal question of labor and capital, to which every subject discussed naturally drifts, caused Mr. Wright to remark that the union stood up to the rules about as closely as the people to whom the operators sell coal, though he declared that the union's action in compelling him to take back men who he felt had been rightfully discharged was exceedingly annoying, to say the least.

In the evening a smoker was held in the Seelbach Hotel at which Newell G. Alford, engineer of the St. Bernard Mining Co., Earlington, Ky., addressed the members on "Recollections of a Mining Engineer." Two reels entitled "Coal Mining in Southern Illinois" and "Sanitation of Mining Villages" were projected on the screen. Following this the Louisville Convention and Publicity League presented motion pictures of "Beauty Spots in Louisville."

KENTUCKY TRIES MILD DOSE OF COÖPERATION

On Saturday, Dec. 9, the meeting opened with an address by E. R. Clayton, secretary of the Harlan County Coal Operators' Association, on "The Value of Local or Group Associations to the Coal Industry of Eastern Kentucky." He detailed what was being done, but as the association had been in existence only two months and as those months were of unusual prosperity everywhere, he made no claims for the work of the association. He said the purpose was publicity and not price regulation, every member of the association keeping the secretary acquainted with actual selling prices, so that no one would sell at a ruinous figure fearing his neighbor was making a low price which had to be met. J. E. Butler declared that the railroad companies break their contracts during the summer when coal is plentiful and enforce them in all their severity in the winter when coal is in demand. He said the Harlan County Coal Association and like bodies should look after this high-handed practice.

J. R. Foster read a paper on the "Coking of Coal in Harlan County, Kentucky," in which he made the statement that with Harlan County coal the Mitchell ovens on trial gave a lower percentage of coke than beehives. This is a statement which will surely meet with challenge. Could it be that the two Mitchell ovens tried suffered from a wet bed, damp walls, and isolation, while the beehives at the Stonega plant were dry and not isolated and therefore economical of coal?

It is strange that the unfavorable references to the work of the Mitchell ovens aroused no comment. They could hardly have passed unnoticed in a state where much coal is coked. The matter is important, for the beehive oven is so extremely wasteful of labor that this is enough to condemn it even if the Mitchell oven should be found in some places really wasteful of coal, which is hardly likely.

T. J. Barr, professor of mining engineering, College of Mines and Metallurgy, University of Kentucky, then read a paper on "The Correlation of Mechanical, Electrical and Mining Engineering," stating that a mining engineer must have a well-rounded education in the correlative branches of mechanical and electrical engineering and should not confine his knowledge to specific mining devices.

Robert T. Caldwell's excellent address on the "Settlement for Mine Accidents Under the New Kentucky Workmen's Compensation Law" was then read by H. D. Easton in Caldwell's absence. The paper did not provoke discussion. It clearly showed that in R. T. Caldwell the Kentucky Workmen's Compensation Board has a chairman of whom it can be proud.

A round-table discussion on "The Miner and the Superintendent" closed the meeting. The advisability of the manager putting aside some time to talk over difficulties with the men was urged. Some of the managers said they were doing this, and J. E. Butler said that when circulating around the mines he was always willing to hear complaints from the mine workmen. At first the superintendents and foremen resented this carrying of complaints over their head, but now they frequently refer matters to him.

However, he never settled any matters at such conferences with the workmen, but heard their complaints and agreed to consider the questions submitted with the official in question. In that way the men were satisfied, and the official did not feel over-ridden. In the good old days the superintendent or foreman would discharge such men as carried complaints to headquarters, but a different practice exists now, and the mine worker seems far better satisfied as a result.

Owing to his removal to Washington, Ivan P. Tashof presented his resignation as secretary-treasurer and it was suggested that Joseph W. Read also resign as assistant secretary-treasurer so that he could be appointed to succeed Ivan P. Tashof. The institute recommended to the executive committee that Joseph W. Read be appointed to the secretaryship for the unexpired term.

COMING MEETINGS

Tenth Chicago Cement Show at Coliseum, Feb. 7 to 15, 1917. Secretary, B. F. Smith, 210 So. La Salle St., Chicago, Ill.

The Rocky Mountain Coal Mining Institute will hold its winter meeting at Denver, Colo., in the Convention Hall of the Albany Hotel, Jan. 22-24, 1917, beginning at 10 a.m. Secretary, F. W. Whiteside, Denver, Colo.

The Brownsville, Penn., Mining Institute will hold meetings on the first and third Friday of each month at 7:30 p.m. Secretary, G. E. Daugherty, South Brownsville, Penn.

American Society of Civil Engineers will hold its annual meeting Jan. 17 and 18, 1917, at Society House, New York City. Secretary, Charles W. Hunt, New York.

The American Concrete Institute will hold its annual meeting at the Hotel La Salle, Chicago, Ill., Feb. 8-10, 1917. Secretary, Harold D. Hynds, 1418 Walnut St., Philadelphia, Penn.

The Labor Situation

General Labor Situation

Another button strike in the anthracite region proves that this particularly distressing form of labor activity (or is it inactivity?) which violates the union contract still persists. A few men in No. 5 shaft and No. 4 slope of the Lehigh Coal and Navigation Co. refused to pay their union dues and consequently went to work without the union button. As a result 800 men went on strike.

The union appears to have backed down completely in its action against the three Shenandoah locals which struck in violation of their contract and were consequently expelled from the union, their charters being annulled and their books and the money in their treasuries seized.

When the case came to court, the union declared itself willing to reinstate the locals, to restore the money in the treasuries, in short, to do everything demanded except give the locals the numbers under which they formerly did business.

The case was heard on Dec. 14. When it was presented, the attorneys for the international organization said that none of the defendants had been served with papers concerning the suit, probably because none of them resided within the state. The expelled locals complained that their members were virtually put into the ranks of nonunion labor by their expulsion. Judge Koch reserved his decision on the case.

The Industrial Workers of the World have extended their operations from the northern anthracite field proper to the semianthracite Sullivan County coal field, about 25 mi. away. Fearing the destruction of buildings, the sheriff of Sullivan County sent in a call for assistance to Troop B of the state police, and a squad of troopers was hurried to the scene on a special train. No violence has been done and the men have returned to work.

Lehigh Coal and Navigation Co. Gives Bonus

Vice-President E. E. Ludlow, of the Lehigh Coal and Navigation Co., established a bonus system at the mines of the company on Dec. 17. At each dump or hoist a fair average of the number of cars handled each working day has been determined and this is termed the "basis." When the average amount dumped in any two-week period equals the basis, the men enumerated in the agreement will each receive 10c. per day above the schedule rate of wages. For each car per hour handled over and above the basis, the men will receive an additional bonus of 1c. per hour. The scheme is purely experimental and will be effective until Apr. 1, 1917.

In central Pennsylvania it appears that James Purcell, of Arnot, Tioga County, will be reelected president. A heavy vote was polled on Dec. 12. It is likely that both Charles O'Neil, the present vice-president, and Richard Gilbert, the secretary-treasurer, will be reelected. The sentiment in central Pennsylvania with regard to John P. White is quite generally favorable.

Labor conditions in Somerset County, Pennsylvania, somewhat improved in the past week. Around Holsopple there has been no union agitation of any consequence. At Hooversville the Knickerbocker Smokeless Coal Co. has been increasing its working forces and now has over two hundred men at work. Fifty or sixty striking miners are still in and around Hooversville, endeavoring, in spite of the injunction against them, to keep these men from working. As a result it has been necessary to put on additional coal and iron police to patrol the town. The Baker-Whiteley Coal Co. at Hooversville is holding its own with the union at Listie. The Stauffer-Quemahoning Coal Co. is keeping at work with an unreduced force.

In the Myersdale section of the county, where the recent agitation has been worst, the Myersdale Fuel Co. No. 1 mine, which has been on strike for several weeks, has resumed operations on a nonunion basis with 32 men, about one-half its normal force. No. 3 mine of the same company is still on strike, but will probably start work soon. The Grassy Run Coal Co. has started up nonunion after several idle weeks with 12 men, about one-fourth the normal force. C. J. Rowe & Bros. sold their Hamilton mine to the Myersdale Mining Co., which has just been organized, and the latter has started work on a union basis. C. J. Rowe is thought to be largely interested in the new company. The Mystic mine of C. J.

Rowe & Bros., which has also been on strike for several weeks, resumed operations on a nonunion basis and is getting out about 50 tons a day. S. K. Bauman & Co. also started up nonunion, with a half-dozen men at work.

In the Connellsville coke region the H. C. Frick Coke Co. posted notices on Dec. 14 of a general 10-per cent. wage increase, effective Dec. 16. This wage increase will be granted by all the Connellsville operators, so about 40,000 men will be benefited.

In the union districts there is considerable unrest among labor, and rumors are in the air that the miners will make demands for wage increases or other concessions notwithstanding the fact that the contract between the miners and operators runs till Apr. 1, 1918. At a mass meeting of miners at Brownsville in the Pittsburgh, or No. 5, district a resolution was adopted to demand a 20-per cent. wage increase. At Monongahela City a similar meeting adopted a resolution to the same effect except that the amount of increase was not specified. Another meeting was advertised to be held at Canonsburg on Dec. 17 for the same purpose. The mine workers' district officials are endeavoring to suppress the movement, but it is doubtful whether they can control the situation, and in some quarters there are fears of a strike by Jan. 1.

Union Men Suspect the Nonunion Operators

The union leaders allege that the agitation for a breach in the contract is deliberately fostered by the nonunion mines in order that there may be a strike during which the unorganized mines will secure union men. There seems no reason to accept any such interpretation of the unrest. It arises solely from the costs of living and from the inarticulate suggestion naturally arising from increases in wages at union mines and in other industries. The Christmas bonuses will further foster this feeling.

Probably the nonunion operators would be quite willing to see the old contract wages continue in force in unionized mines, even though the steady operation and competition of union mines has to be met. They would be quite well content if they could draw off the cream of the union workers. Even without a strike to assist them it is quite likely that the nonunion operators will make large inroads on organized labor. The unions have denounced sliding scales as a trap. Now they realize that a sliding scale for the union men is better than an immobile contract.

The desire for a new wage scale is shown not only in western Pennsylvania, but in Ohio and Indiana also. The miners of the Hocking Valley subdistrict, to the number of 10,000, met at Glouster to make demands for increased wages.

Clinton Miners Have Meeting with Operators

In the State of Indiana the mine workers and operators have reached the point where changes in the wage schedule have been already discussed. A leading point at issue was the price demanded by the companies for the coal supplied to the mine workers. This rate will be \$2.65 per ton as formerly ruled or a reduction of 35c. from last month's rate. The men also wanted a full day's pay whenever they go into the mine instead of a few hours', which is all they get when there is a lack of railroad cars. This was not granted, but henceforth the coal cleaned off the entries will be divided equally between the operators and the men.

In his report of the November operations of mines in Greene, Sullivan, Vigo and Vermillion Counties, recently made public, Secretary Phil Penna, of the Indiana Bituminous Coal Operators' Association, has given the public some idea of the slow running time of the mines, regarding which the mine workers are protesting. The average running time of all mines was 16 $\frac{1}{4}$ out of 25 possible working days, or not quite two-thirds time. Mr. Penna declared that the mines could have worked full time if they could have obtained cars.

Sixty-four days was the total of all mines, and the days were divided on the mines of different railroads as follows: Chicago, Terre Haute & Southeastern, 16.4; Vandalia, 16.7; Chicago & Eastern Illinois, 15.6; and Big Four, 15.6. These figures were stated by Mr. Penna to be approximate, or as nearly as could be compiled from the data at hand. Some mines, such as those on the Monon R.R., received more running time, but were so favored by advantageous facilities that it would not be fair to include in these averages.

Mule drivers in six mines of the Clinton field organized a strike of their own a few days ago and did not return to work for several days. During this time officers of District 11 of the United Mine Workers of America were told not to meddle and were assured that the strike did not concern the organization in any way. The mines idle as a result of the strike were the J. K. Deering Co.'s mines Nos. 1 and 8, Miami Nos. 6 and 8, Jackson Hill No. 5, Keller No. 2 and Bogle No. 1.

The drivers quietly got together and made their demands upon the operators of these mines, asking for 9-hr. pay instead of the 8-hr. pay they now get. This additional compensation was demanded as pay for taking the mules to and from the mines. The men asserted that this required about half an hour in the morning and the same time in the evening.

The contract now in effect between the operators and miners provides that the taking of the mules to and from the mines be done outside of the regular working hours. The operators rightly contend that this question was covered at the time that the contract for two years—1916 to 1918—was made and cannot be changed at this time. The mines having electric haulage were not affected by the strike, but in one mine where motors are used entirely the trip riders asked for the same increase as the mule drivers.

President Edward Stewart and Vice-President Shiel, district officers of the United Mine Workers, went to Clinton in an effort to patch up the difficulty, but were plainly told to go about their own business. With 3,000 miners thrown out of work because of the action of the drivers, it appeared as though the strike would have a material effect upon the coal business, when the strikers suddenly returned to work without their wages being raised. They had hoped to raise them from \$2.98 to \$3.25 a day.

Mine Workers Have To Pay Union \$7,700

In Illinois the union men and operators are rejoicing over the termination of coöperative mining. Despite all the desire for more coöperation which has been expressed by operators and by unions, despite the fact that everyone believes there should be a friendly accord and coöperation between capital and labor, the coöperative mining in Illinois was denounced by everyone.

Two years ago Oliver Winkle leased a mine to the miners. They operated it on a coöperative basis, hoping to get more than mere wages. But when times were bad they lowered prices to such an extent that the miners had to divide the losses among themselves. They underbid everybody and demoralized the market, impoverishing themselves and the union men with whom they competed.

The mine was finally taken over by Winkle, but before it could be reopened it was necessary for the mine workers to make their peace with the union. They were required to pay an initiation fee of \$10 and a fine of \$100 each. As there were 70 men, their contribution to the organization was \$7,700.

In making his quarterly report Duncan McDonald, the secretary-treasurer for the Illinois District of the United Mine Workers of America, states that there was a balance on hand Nov. 1 of \$1,332,141.34, as against \$1,273,673.18 on Aug. 1. He expresses anxiety concerning \$575,000 listed as certificates of deposit and loans. This item includes \$50,000 loaned to the Colorado District during the strike which culminated in the Ludlow trouble. Other loans are one of \$250,000 to the International organization, \$185,000 to the Ohio District and \$100,000 to the Western Federation of Labor. Since the report was made the Ohio district has repaid \$10,000 on account. The state organization loans money to locals at 3 per cent., for the purpose of enabling them to form coöperative or relief societies.

Illinois Operators Penalize Bonus Givers

The shortage of labor and high prices received for coal on short-time contracts has caused some operators in Illinois to give premiums and bonuses. As a result the Illinois Coal Operators' Association, E. T. Bent, president, and F. C. Honnold, secretary-treasurer; the Coal Operators' Association of the Fifth and Ninth Districts, Thomas T. Brewster, president, and C. H. Krause, secretary-treasurer, and the Central Illinois Coal Operators' Association, H. C. Adam, president, and W. T. Walsh, secretary-treasurer, have addressed the following letter to the coal operators of Illinois who are parties to the existing labor contract with the United Mine Workers of Illinois. This letter is dated Dec. 7, 1916:

At a meeting of coal operators (Great Northern Hotel, Chicago) today, bitter complaint was made that premium and bonus payments were being offered to drivers and other day labor, with a view of attracting employees from their present location.

In times of temporary business stress and labor shortage, like the present, there is always a temptation, in order to provide for immediate need, to pay certain individuals or classes of labor a premium or bonus of some sort, to the great injury of the operators as a whole, including those who originally expected to benefit by so doing, since it invites reprisals and tends to bring about disruption of all organizations.

There are rumors, here and there, of operators resorting to this dangerous and unwarranted expedient. The purpose of this circular letter is to cause any who have so done to desist and to put everyone on guard for the protection of all. In the early days of the joint movement in Illinois, trouble of this kind prevailed and was finally eliminated only with the greatest difficulty, but to the general and acknowledged benefit of operators and miners alike.

It is important and vital that every operator shall recognize the extreme importance of adhering faithfully to the contract provisions. All must realize that our organizations should not and cannot tolerate any deviations therefrom by the members of our associations.

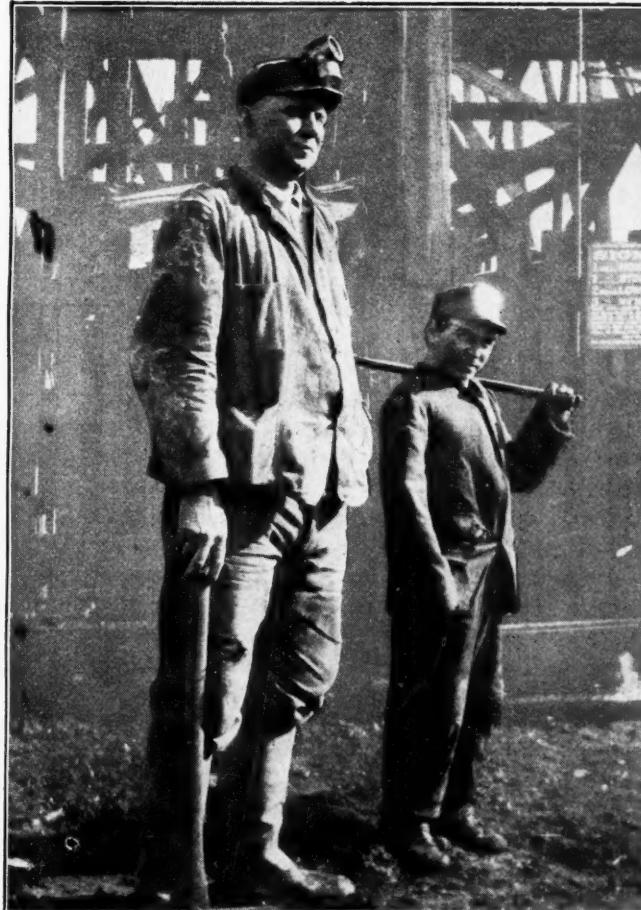
Should you have credible evidence that any operator in your district is offering a premium or bonus to any of his own men, or offering any such premium or bonus to any of your men, in an effort to hire them away from you, we recommend that you take the matter up with him personally. Failing to correct such abuse, we suggest that you present the facts to the organization of which you are a member. Should you have credible evidence of premium payment being made by an operator in some other district, please present the facts to the organization of which you are a member.

No effort will be spared on the part of the respective organizations to prevent such departure from the terms of the contract, by anyone, and punitive action, in the form of membership cancellation, will be taken in every case established.

The bonus increase where mines are many and under many different operating companies is a matter of bitter contention. Where a large company like the Lehigh Coal and Navigation Co. gives a bonus, it only stops men from leaving for other industries; it can hardly be expected to draw men from other mines, and it was doubtless not so intended. The idea which animates the "Navigation company" proposal is the encouragement of efficiency, whereas some of the recent bonus systems are little more than thinly veiled new wage schedules.

At present writing it seems that John P. White will defeat John H. Walker for the presidency of the United Mine Workers. In fact, few changes in personnel are likely to be made in the union, a consummation devoutly to be wished, for the present officers show a disposition to do their duty under the contract. Furthermore, when the operators have to deal with the same men as signed the original contracts, they are better able to keep them bound to the covenant. When pressure is brought to bear on new men by the mine workers they are apt to say that they will not support an agreement which they would not have made had they been in office when the negotiations were being made.

* * *



BIG JIM AND SHORTY, RUSSELL MINE, FIRESTONE,
WELD COUNTY, COLO.

Editorials

A Move To Foster Sectionalism and Hinder Education

A bill has just been introduced in Congress as a "rider" on the Post Office Appropriation Bill, which proposes to tax national journals out of existence by placing upon all publications a postal rate based on the distance of transmission, as follows:

Up to 300 mi.....	1c. per lb.	1,000 to 1,400 mi.....	4c. per lb.
300 to 600 mi.....	2c. per lb.	1,400 to 1,800 mi.....	5c. per lb.
600 to 1,000 mi.....	3c. per lb.	Over 1,800 mi.....	6c. per lb.

Should this proposed act become a law, the circulation of every national journal in the country will be greatly restricted. In fact, the tax coming coincident with the present high cost of paper may force a large number of journals to discontinue publication.

No force has been more effective in leveling the barriers of sectionalism than the great national weeklies and monthlies. No educational work has ever equaled in value and secured the results brought about by the trade and technical business papers. Engineering practices have been standardized and operating plans have been increased in efficiency by a broad interchange of ideas.

It was thought worth-while to reduce the postage on mail to foreign countries because it brought us closer to our friends across the seas. Yet the Administration proposes to hinder the progress of America's industries by adding a tax to the present cost of disseminating information and exchanging business ideas.

The establishment of zones in the conduct of the parcel post is beneficial to the little fellow who runs a local store in a small town. Such a man cannot compete with the big mail-order house located in the city. Like protection is not afforded anyone by the proposed plan to apply the zone system to all second-class matter.

The cost of handling mail—in fact the cost of handling any kind of shipment—is largely incurred at the terminals. It is the charges resulting from loading and unloading any article, whether it be a letter, a paper or a barrel of flour, that raise the cost. Once on its way, the article can go 2,000 miles with little more expense than 100 or 500 miles. So say the experts who know.

The Government yells conservation, but is credited with supporting this measure that will render it more difficult for Jones in Colorado to profit by the experience of Smith in Pennsylvania. We talk of uniformity in system, and we read almost every day of the benefits that will accrue to our national industrial life through increased operating efficiency. This proposed tax on the distribution of national journals is the hardest blow ever delivered at the businesses we are presuming to foster.

Coal Age appeals to every man in coal mining, whether he be president or miner, to oppose this effort to increase the rate of postage on all second-class matter. If this paper, or any other national weekly or monthly journal has benefited you, has given you new ideas that have increased your individual efficiency, has helped you advance in your chosen work, then we beg of you to write your

Congressman, telling him plainly that you are opposed to the Randall tax on all national periodicals. The saving to the Government will be \$17,000,000, which amount it proposes to spend in some other way. The cost to our great industries, and to the men engaged in them, will be many times the saving the Government will effect. The business papers of the country are fighting to keep their subscription rates at the low cost to the reader that now prevails. This stand is right, morally and practically. Won't you help us?



Doubt in Old Land Surveys

The wonder is that with so much clumsy and inaccurate surveying in the early days there has been any title at all to lands in the states thus surveyed. Nothing but the genius of the courts in hanging everything onto the remaining ancient corners, and their steady refusal to permit the described metes and bounds to question the actual marks on the ground, has saved us from utter confusion and the need of a general property resurvey.

Every land owner who is short of ground believes he has a moral right to remove his neighbor's landmark, and he readily grants to his neighbor the right to recoup himself by shifting the land of the next proprietor. Where more ground has been sold than Nature very kindly bestowed on the owners in question, no one knows what would happen if the claimed rights were acknowledged in the courts of justice.

Fortunately, the original surveyors were quite generous, and in following them the trouble is to divide the surpluses rather than to apportion the deficiencies. It is interesting to recall some, though only a few of the inaccuracies which entered into the determination of early lines: The loss of surveying pins, the disregard of a whole tally, the sticking of a sluggish compass needle, the presence of ore deposits which made the needle depart from true polarity, the rough work done when night, or worse yet, a band of Indians approached, and the deflections resulting from running a line which persisted in following deep water, causing the wrong tree to be located when the stream had been with difficulty forded and crossed.

Many early surveyors, and some not so early, measured up and down the sloping ground, perhaps taking a step or two in addition to make up for the error in measurement thus arising; and they thought that blazing all the trees within reach of their axes was quite the right way to mark the line. And how far could not the axeman wander when going ahead of the compass and slashing off chunks of bark before the compassman had the line ahead determined!

In Pennsylvania, apparently, if general repute is to be accepted, the allowance was 10 per cent. in lineal dimensions, said to be allowed for public roads. It is true that this excess in distance is rarely if ever found; and if it really was 10 per cent. linearly, the areas would be 21 per cent. larger than the record would show.

Imagine an allowance so large for such a small purpose. It is evident that the idea could not be to protect the buyer against an excessive confiscation for road-making purposes. New York City would not be hampered badly for lack of roads if 21 per cent. of its area were so allotted, though in built-up portions more ground is actually used for that purpose.

Clearly, therefore, such a large allowance was not necessary in the hilly country of western Pennsylvania where in a majority of places the 30- to 66-ft. roadways are nearly a mile apart. The purpose of the surveyors was rather to permit of erratic measurement with chains of extremely variable length dragged over ground that rose and fell in a manner disconcerting to a surveyor who sought both speed and accuracy. One who never used the old surveyors' chain does not know how the links lengthen out when hammered. Also, with wear on perhaps 397 large and small links, having 794 rubbing surfaces, there was great possibility of extension.

But, as stated, it was a miracle how a link that had been bent in the woods would grow in length when beaten flat on a smooth stone. A 100-ft. chain would acquire a foot additional length in a few months and a Gunter's chain having as many links would be almost as aspiring.

Trying to retrace surveys made so carelessly and with such crude tools what can the modern surveyor do, and how can members of the craft agree if they start from different premises? There are an infinite variety of solutions, and the surveyor is to be excused if like the lawyer he takes a partisan position and gives his client the benefit of any doubt.

* *

The Ultimate Objective of the Technical Journal

In years far past, the technical journal as it then existed was but a poor shadow of its successor as we are beginning to know it today. At that time, and as it still is with many publications, it was little more than a listing of technical machinery and descriptions of pumps, hoists, boilers—almost an illustrated catalog.

Later it evolved into or existed contemporaneously with a trade journal, quoting prices and products and generally devoted toward a forward movement in sales. Later still, technique and sales combined to provide the paper almost as we have it now, and as a result of this combination, the journal gained in breadth and prestige because of the interesting fact that each separate branch came to know and understand the relative importance of the other.

But even yet, with all our progress, many journals still deny the right of their pages to labor questions and sociological problems allied thereto, or treat of them only from the point of view of being objectionable subjects to the readers they profess to serve. In doing so, they deliberately or unconsciously claim that the technical journal should be the representative or organ of only one section of the industry and that section the engineering or operating end. They protest against the right of a journal to exist for and with the industry as a whole despite the uneven progress of all the concomitant parts.

These papers forget that just as the technical man and the salesman combined in earlier days to their mutual advantage, so a greater combination of all the various

factors and functions that go to make up the coal industry must inevitably be to that industry's advantage. The coal industry of today is not the result of a one-sided effort of one or two men, of one or two capitalistic groups, of one or two constellations in a system. Rather is it the result of a coördination of factors—capital, labor, education, knowledge, effort and progress—each of which is a part of a whole that would be lost without its complement. Therefore, for the sake of harmonious progression, each part thereof deserves a proper hearing in the presence of the others, since only by discussion, which precedes understanding, will all the miserable, suspicious and exotic circumstances that at present clog advancement be dissolved. To provide the medium for that discussion is the function and the objective that technical journalism is striving to attain.

Slowly we are getting there. Bit by bit, and year by year, we add new features that are aids to clearer understanding. Every issue enables us to build stronger toward this goal. Already a great amount of our space has got away from the purely technical description and from the mere listing of prices. We devote, and will continue to devote, space to problems that a few years ago would have been classed as outside the scope of any journal. Subjects that were the prerogative of the mining society and even frowned on there, are now openly thrashed out and considered by the "democracy" of the industry.

Such a policy means that we are slowly evolving a sense of national responsibility in regard to the progress of our great industries—a state of feeling that has hitherto found practical expression solely through the medium of presidential remarks at annual company meetings.

That a strong desire to participate and help along this progress should exist among the rank and file of the coal trade is one of the most gratifying features of the industry. This was clearly shown in the results brought out in the competition held by *Coal Age* on the subject of the best idea for fostering general progress. Let us all then combine and work together in the future even more pronouncedly than we have in the past toward ends so eminently desirable and to the advantage of all, advancement of industry, spread of knowledge, increase of service and diminution of dispute.

* *

More Railroad Impositions

It is rumored that some nine or ten of the important eastern Kentucky operators recently received a proposal from the Louisville & Nashville R.R. that they would be supplied with cars for full-time operation if they would sell the road coal for its own uses at \$1.10 a ton, an increase of 10c. over the price on Dec. 1. It is stated that instead of being given pro rata supplies of cars as at present, the mines were to be supplied for a six-day run each week, on condition that the offer of the road was met.

Most of the operators to whom the offer was made have declined it, although some are said to have accepted it. These latter are now operating on a full-time basis, the additional outputs going to the Louisville & Nashville. With the average range of commercial prices for coal at the mines around \$3.50 and \$4, most railroads are probably paying at least \$1.25 for their coal. It would seem that some action should be taken to eliminate any preferential treatment of this character.

Discussion by Readers

Repair Supplies Reduce Cost

Letter No. 1—In his article on "Conducting Electric Power," *Coal Age*, Dec. 2, p. 911, Robert Brown incidentally touched on a matter of great importance in the operation of all mechanical equipment in mines and shops, when he urged the keeping of the right kind of supplies on hand for making necessary repairs quickly when needed.

It is strange that superintendents who are anxious to reduce the cost of operation so frequently ignore the question of keeping on hand these supply parts ready for instant use. In many of the large mines equipped with coal cutters and power drills there are frequent delays caused by the breaking down of a machine in use and the necessity of sending to the factory to replace the broken part or, which is frequently done, supplying the parts from their own or a local shop.

Many a machine boss or mine electrician has found it practically impossible to bring those in authority to understand that a great saving would be effected by keeping on hand these necessary parts, which are so apt to be broken or give out when they are most needed. The conclusion reached, in many cases, is that it is not economy to keep on hand a supply of this material, which can be provided quite promptly by a "rush order" whenever the need arises in the mine.

WHAT THE MAN ON THE JOB KNOWS

The man on the job knows that every hour a cutting machine is idle means so much added to the cost of producing the coal. He knows that if the supplies were on hand, the necessary repairs could be made in a short time, with the result that the accident would not show on the tonnage-sheet of the mine.

It frequently happens that a company will attempt to lower the cost of repairs by having these needed parts made in its own shops or by some local concern instead of sending to the factory for what is wanted. It will occasion no surprise that this practice generally results in a loss to companies, which, nevertheless, persist in the delusion that they are practicing economy. In many cases these homemade repairs have seriously damaged the machine, which must ultimately be sent to the factory. The reason is owing to several causes, such as misfits, poor material, bad workmanship, etc.

ECONOMY IN SEPARATE FEED WIRES FOR MACHINES

I fully agree with Mr. Brown in what he says in regard to the necessity of installing separate feed wires for machines and drills, instead of tapping the trolley wire for the purpose of operating such machines and pumps. A mine electrician, however, may talk himself into a sweat, without being able to gain more than a sectional switch, if even that is allowed him.

Year after year managements are willing to stand the expense of armature burnouts that would not have occurred had a separate feeder been installed, but they are

slow to admit such a necessity exists, believing that the trolley is good for furnishing all the power required in the mine.

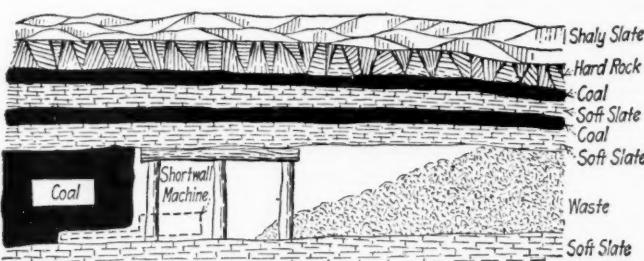
In closing I want to say that those who have tried the plan of separate feeders for machines have not found it wanting, while those who have not tried it have a surprise in store for them when they finally adopt that system.

FRED L. SERVISS,
Golden, Colo. Machine Boss and Mine Electrician.

Timbering After Machines

Letter No. 1—Having had about eight years' experience in five or six different mines where shortwall machines were used in pillar workings under my supervision as fireboss, assistant foreman and mine foreman, and being familiar with the roof conditions referred to by John H. Wiley, Oliphant Furnace, Penn., *Coal Age*, Dec. 2, p. 941, I want to say that I could not subscribe either to his method of supporting the crossbeam, in machine mining, or to that which he says was suggested to take its place. In my opinion neither of these methods would be a safe one to adopt.

The plan of wedging a crossbeam over a single post set 14 in. from the butt end of the stick, I believe, would give the collar too great a leverage. In case the slate let go close to the face of the coal it would trip the post, and the slate would fall on the men operating the machine beneath. Again, in the second method, if the coal gave



UNDERCUTTING A LONGWALL FACE

way, this would leave that end of the collar unsupported, and a fall of roof would result.

My experience has taught me that where the top requires crossbar timbering, it is best to set both legs under the collar at once. Then, as the machine approaches and it is necessary to take out the leg nearest the face of the coal, first stand a third post under and as near to the center of the collar as possible and then remove the other leg. When the machine has passed the place, the post that was removed should be reset at once, after which the center post can be taken out.

I have drawn a rough sketch to illustrate my meaning. The sketch shows a single set of timbers, after the center post has been set and before the face post has been removed. The position of the machine is indicated by the dotted line. As the third post is taken out behind the machine, the former can be carried forward and set under

the collar in advance of the machine. I consider this method is the safest one to adopt under the conditions described, and which I have attempted to illustrate in my sketch.

ERNEST KRAUSE.

McDonald, Penn.

Letter No. 2—As timberman, kindly permit me to give my own plan of working and timbering under the conditions described by John H. Wiley, *Coal Age*, Dec. 2, p. 941.

Because of the bad roof, I would drive the roads 9 ft. wide on 25-ft. centers, setting crossbars every 4 ft., as Mr. Wiley has stated. I would set a single post under one end of the bar and hitch the other end into the coal about 6 in. The hitch should be cut in the rib that is to be drawn back when the place has been driven up to the limit, and the track laid along this rib. When the place has been driven up, a crosscut should be driven 9 ft. wide, so as to give the machine a 30-ft. cut along the rib.

As this cut is made by the machine, a timberman follows and sets a second post under the end of the timber supported in the hitch of the coal. It is necessary to wedge the timbers tightly, so that when the coal falls it will not knock out the post.

After the coal has been shot down, loaded, and the place cleaned up, the miner must cut new hitches in the rib and set collars in these hitches supporting the other ends on posts, as before. It may be necessary, also, to lag the roof between the collars.

The night timberman follows the machine and sets a second post under the end of the collar supported in the hitch. He needs no helper for this work. It is the duty of the rib-boss to recover as many of the collars and posts as possible before they are covered by the falls and lost.

Leckrone, Penn.

TIMBERMAN.

X

Explosive Combustion of Dust

Letter No. 1—I was interested to learn that the Federal Bureau of Mines has made another test on the explosibility of coal dust, at its Bruceton mine, as recorded in *Coal Age*, Nov. 25, p. 890. This time the test was made to determine whether or not the coal dust of the Clearfield mines is explosive, and the dust used in making this test was taken from those mines.

It is stated that there has never been a dust explosion in the Clearfield region, and that the coal operators there contend that dust does not form a dangerous factor in the operation of their mines. It was to settle this disputed question that the Bruceton test was made, and the result was a most violent explosion.

Since the engineers of the Bureau of Mines have proved that the Clearfield dust will explode under certain conditions, which prevailed in the Bruceton mine at the time of making the test, they should, for practical purposes, proceed to ascertain and explain in what manner the conditions in the Bruceton mine differed from those existing in the mines of the Clearfield region.

Certainly the Bruceton test can have no practical value until it is shown why, if the dust is explosive, there has never been a dust explosion in the Clearfield mines, from the beginning of operations in that locality up to the present time. If the bureau fails to account for this apparent discrepancy between the results of its test and those

realized in actual practice, there can result no benefit to anyone, except it be to the insurance companies doing business in Clearfield County, who would use the results of the test as a strong argument to boost their rates.

My experience in mine inspection work and the investigation of mine explosions convinces me that it is important to have a correct knowledge regarding the fundamental requirements for obtaining the explosive combustion of dust and, to my mind, this is but another instance showing that necessity. Without such a knowledge it is naturally impossible to give a correct explanation of the difference between the results of the Bruceton test and the practical operation of the Clearfield mines during an extended period.

In the article to which I have referred, it is stated that the bureau engineers refused to advance any opinion in explanation of this difference. Let me urge that this matter be further carefully investigated along lines that will eventually bring to our knowledge a more exact conception of what is required to produce explosive combustion of coal dust.

JOHN VERNER,

Chariton, Iowa. Former State Mine Inspector.

X

Coal-Mining Examinations

Letter No. 8—I am much interested in the discussion of the matter of coal-mining examinations. I note that John MacNicol, *Coal Age*, Dec. 2, p. 939, refers to the requirement of the Pennsylvania mining law, that applicants for mine-foreman certificates must be "citizens of the United States" and have had "at least five years' practical experience after 16 years of age as miners or mining engineers or men of general work inside the mines of Pennsylvania."

While I am willing to acknowledge that it seems a little absurd to place practical mining men on probation for five years before permitting them to act as mine foremen in Pennsylvania, I feel that it would be unjust to miners born in this country to put the foreign-born miner on an equal footing with him. Should an American citizen go to the countries from which these foreigners hail, he would have to work as a miner, for a time.

Again, it must be remembered that, while other countries produce mining men equally competent with those in this country, the conditions and methods of mining are not the same here as there. While the foreign-born miner is waiting five years for his citizenship papers, he will have an opportunity to become acquainted with American mining laws and methods of mining. I assume that this is the purpose of the law in this respect, although I admit that the same argument will not apply to miners hailing from other states than Pennsylvania as being debarred from mine foremanship in that state.

CHARACTER OF QUESTIONS NEEDED

Referring to the statement of John H. Wiley, on the same page of *Coal Age*, to the effect that mining questions should "involve a working knowledge of mining equipment," permit me to say that I believe few mine foremen can be found who would be able to remedy the many troubles experienced in the operation of different mining machines. I do not wish to criticize Mr. Wiley too sharply, and must say that a little knowledge of machinery and a little experience in the operation of mining machines will not hurt any foreman, but help to make him a more capable official.

However, I do not think that it would be justice to expect candidates in examinations to answer questions concerning the repair of electrical machinery and other equipment. In many cases the company employs mechanics for this purpose. I consider that it is more important to ascertain if the candidate has a knowledge of how to conduct a ventilating current around the mine and to give proper instructions to men as to how they can work with safety to themselves and others.

I cannot recommend the use of textbooks in an examination, as I believe anyone can pass an examination when told what rule or formula to apply. I have attended three mine-foreman examinations in Pennsylvania and can say that the questions asked covered almost every important point in the work of a mine foreman. I believe that any practical man with a little study and education should be able to gain the 80 per cent. required in order to get his certificate. SAMUEL JONES.

Madera, Penn.

*

Textbooks in Examination

Letter No. 4—I note with interest that the subject of the use of textbooks by candidates, in examination for certificates of competency, is being discussed broadly in *Coal Age*. Before offering my opinion on this matter, I will venture to predict that the greatest opposition to such proceeding will come from men who have acquired their certificates after long and hard study. The opposition will be similar to that of the old miners who fought the introduction of mining machines a few years ago. I believe, however, that the final verdict will be in favor of the use of textbooks.

After a service of 14 years on examining boards, I do not hesitate to say that in my opinion textbooks can be used by candidates in examination, when properly regulated by the examining board. I believe that this will in no way lower the high standard set by the board as that to which a candidate must attain in order to secure a certificate.

More than once I have observed that an applicant has failed to receive a passing mark in examination, because of the time consumed in trying to recall the correct formula for the solution of some problem in ventilation, pumping, timbering or haulage. The time lost in pulling his hair and scratching his head to recall this formula, which, in nine cases out of ten, has proved to be the wrong one, prevents him from answering many of the practical questions; and these generally carry the greatest percentage of marks.

BARRING TEXTBOOKS TEMPTS CANDIDATES TO BE DISHONEST

There is, however, another important feature connected with this controversy that is often overlooked. The prohibiting of textbooks in examination tends to develop dishonest methods among the candidates, who realize that they need some assistance in order to enable them to pass the examination. It is quite generally acknowledged that it is a practical impossibility for a man to remember formulas and, as a consequence, candidates will often carry them to examinations written on a slip of paper or on their cuffs. This practice gives such candidates an unfair advantage over those more honest.

The average practical man knows full well that he cannot hope to memorize the formulas required for the

solution of the many problems that continually arise in mining practice. On this account he concludes that it would be lost time for him to attempt to take the examination as it is at present conducted.

Permit me to suggest here that it would be of great benefit to the practical mining man if a small pocket textbook could be prepared, suitable for use in examination and containing only those formulas that are simple and yet important in daily mining work. Mine foremen would carry this little book with them every day and refer to it as the engineer consults his fieldbook for making calculations in the field and office. In my opinion the result would be that mine foremen would thus become more familiar with the solution of problems in ventilation, pumping, mechanics, haulage, timbering and electrical work, and grow to be more efficient and valuable in the position they hold.

It is the technical portion of the examination that gives the practical candidate the most trouble. He is able to understand the practical questions and answers these readily, according to his experience in mining. The oral questions are designed to test the candidate with respect to other capabilities than his actual knowledge. A man may know what ought to be done but not be able to collect his thoughts in a moment and act promptly. The oral examination shows a candidate's ability to act on his knowledge promptly when the emergency calls for quick and intelligent action. The oral is also designed to show a candidate's discrimination and judgment in respect to matters in his charge.

THE TEXTBOOK IN MINING PRACTICE

In answer to an objection that is often raised I want to say that giving candidates the use of a proper textbook in examination is not by any means giving them the answer to the question; nor does it aid or give them any assistance that is not available in their daily practice in the mines. The candidate for successful foremanship must so familiarize himself with the textbook that he is able to find and apply the correct formula for the solution of a problem.

In practice a competent foreman seeks information from his textbook in the same manner as the engineer goes to his fieldbook or the professional man to his library. The proper information cannot be obtained from textbook, fieldbook or library by the inexperienced man who has not studied the source of information and become so familiar with these aids to his work that he knows how to apply them to a particular case.

By denying a candidate the practical aids to which he has always had access in his daily work, an examining board places itself in the position of testing a candidate's ability to memorize formulas and constants required in his work. It goes without saying that this test of memory has no relation to the candidate's fitness for the position he seeks, and should be entirely eliminated from every practical examination.

In closing I wish to say that I am heartily in favor of the use of textbooks in examination. It cannot detract from the high standard set by examining boards, but will, on the contrary, give us more efficient mine officials and a greater number of men thoroughly equipped with respect to theoretical and practical mining.

F. W. CUNNINGHAM, Mine Inspector,
Somerset, Penn. 20th Bituminous District.

Reward of Long Service

Letter No. 3—The problem suggested by "Dee," *Coal Age*, Nov. 4, p. 776, is one that no doubt has confronted many a good man caught in a similar position. It is simply a case of the right man in the wrong place—a deserving employee and an unappreciative employer. However, in justice to the average employer, it must be admitted that such instances are the exception and not the rule. Although not always the case, merit is generally recognized and rewarded sooner or later by the successful operator.

In a somewhat unusual experience, extending over a period of several years, which has brought me into close personal contact with both employers and employees in many parts of the country, particularly those engaged in mining operations, I have had many opportunities to witness instances of this kind. I will cite one case in which I was brought into closer contact with the parties concerned and which will serve as an illustration of my contention that true worth will generally meet its reward. The facts are as follows:

A TRUE INCIDENT

A young fellow some years ago occupied the position of assistant foreman in one of Pennsylvania's largest producing mines. He was a hard working, conscientious fellow and had, in turn, secured fireboss and second- and first-grade mine foremen's certificates. At the time of my story, he was shouldering the big end of the responsibility for the production of coal in this particular mine.

In the course of time several changes were made in the position of mine foreman, to which he naturally aspired. Much to his discouragement, however, Bob was still retained in his place as assistant, while several new men from other fields were given a trial and served their time in the position above him. To Bob's credit it can be stated that, like many other assistant foremen placed under similar circumstances, he performed the very essential duty of breaking in the new foremen, owing to his superior knowledge of the working details in the mine. This service, it must be acknowledged, was performed with some discomfiture, because of the great disappointment to the assistant in not receiving the coveted appointment.

THE MAN FINDS HIS RIGHT PLACE

Evidently the impression that existed in the mind of the man higher up, with respect to the assistant foreman, was that men might come and men might go, but Bob would always be on the job, as he was a good, faithful and industrious employee. But, as the saying goes, "The worm will turn." Discouraged at the prospect in his present position, Bob got in touch with a mine owner in another district and received the appointment to take charge of his mine, with the result that two years later he was appointed to the position of superintendent of the mine and became pretty well known as a mining man of ability.

It then happened that the ownership of the mine changed hands and, as is generally the case, the new owners had their own men, so that it looked as if Bob would shortly be in the market for another position. What was his surprise at this juncture, however, to receive a summons from his old employer to come back and take the position of superintendent of the mine where he had formerly served as assistant foreman. The superintend-

ency offered a salary double that which he had received as assistant foreman less than three years previous, and was gladly accepted.

The sequel of this little incident proves that Bob was the right man in the wrong place, when holding the position of assistant foreman. The second employer quickly recognized the worth of the man and gave him the opportunity for the development of his latent capabilities. It may be that the fault, in the previous case, was not altogether with the employer but rested, to a large extent, with the man himself. He may have been diffident and hesitated to assert himself, lacking confidence in his own ability and the backbone to demand recognition.

To the shortsighted employer who fails to recognize the latent capabilities of men in his employ, I would commend the following verse taken from the short poem by R. T. Strohm and published in *Coal Age*, Nov. 25, p. 869, which is well worth the reading:

Nothing kills his high ambitions
Quite so thoroughly as when
He observes advanced positions
Go to new and untried men.
So you really cannot blame him
If his spirit's dull and dead,
When you don't intend to name him
For the better job ahead.

Dee's proposition is not an uncommon one in other industries than coal mining, and allow me to say that its solution lies largely with himself. If he feels that he merits the promotion, and it does not come to him in due time, it is up to "Dee" to make the move as did Bob in the case I have just cited, which is true in every respect except that the man's name was not "Bob."

The old adage that "A rolling stone gathers no moss," is not always a safe motto to adopt. When a man feels confident that he is capable of better things and yet fails of recognition after a proper length of time, there is nothing left for him to do but to move and so demonstrate his capability.

SIM C. REYNOLDS.

Houston, Penn.

*

An Efficient Coal Miner

Letter No. 10—I have read with much interest the different letters defining what, in the opinion of the writers, makes an efficient coal miner, particularly the letter of Alexander Waugh, *Coal Age*, Nov. 11, p. 818. In addition to the requirements for efficiency, stated in the last paragraph of that letter, there are one or two items that he has omitted. These, I believe have not been mentioned in any of the other letters, but if practiced by miners generally would go a long way toward assisting in the economic production of coal. I refer to the care and skill used in respect to supplies sent into the mine.

For example, a timberman needs a 6-ft. prop. Failing to find one of this length in the place he expected, he takes an 8- or 10-ft. stick found there and cuts off the end, instead of going a little farther, where he would have found a stick of the right length. This is certainly a waste of both time and material. The man may be a good timberman and miner and have a capacity for work equal to 100 per cent., but his efficiency falls to about 65 per cent. when this loss of time and material is charged to his account.

I am taking the term "miner" as including all shift hands working underground. Take a roadman or track-

layer, for instance, engaged in laying a switch. He wants a short length of T-iron to connect the frog with the rail in the main track. Instead of cutting the piece that comes nearest to the desired length, he takes it off the end of a long rail lying near. Or, at another time, he may cut off two or three feet from a rail and leave the short piece lying at the side of the track, where it is liable to trip a driver striving to avoid a rapidly moving car. I have seen such an accident happen, and it taught me the necessity of taking care of such material and putting it where it will do no harm and be ready for use when needed, or throwing it on the scrap heap if too short for use.

A GOOD SUGGESTION FOR TRACKMEN

By a little forethought on the part of a foreman, much of the waste in cutting T-iron when laying room switches can be avoided by adapting the room centers so that they will permit of the laying of a switch between full length rails on the main track. This, of course, is not always possible, but it will frequently be found to effect a great saving of time and material where the room centers are uniform.

There is a tendency for trackmen to use old ties once too often—ties that have lost their power to hold the track in place. Such a tie may last a little while and then give way under a heavy car, which is derailed, perhaps causing a fatal accident. At any rate, the time lost in replacing the car on the track and the expense incurred will far outweigh the cost of many ties.

It is just such cases as these I have mentioned that show the inefficiency of the workmen. Men who by their thoughtfulness and good judgment avoid these things are among that class of miners that can be termed "efficient."

West Leisenring, Penn. ROBERT W. LIGHTBURN.

[This letter closes the discussion of "An Efficient Coal Miner."—Editor.]

*

Favors Unappreciated

Letter No. 2—Reading Letter No. 1 on this subject, *Coal Age*, Nov. 4, p. 775, recalls an incident that occurred in my own experience when employed in a mine in France. The company there founded an institution designed solely for the benefit of its miners and other employees. The results, as I shall cite them, prove that the average miner does not assume the "haggling attitude" so often attributed to him.

In the letter to which I have referred, Carl Scholz asked, "What causes this haggling attitude of the miners? Is it the desire of the average miner to assume such an attitude or is it the work of the overzealous official, who desires to make a record for himself, fearing otherwise to lose his job?"

In my opinion the agitators are the ones who are responsible for most of the troubles of coal miners. They pat the miner on the back and boast of having secured a few cents' raise in the wage scale, forgetting that to do this the miner was compelled to lose, perhaps, two or three months' wages owing to the necessary strike. On the slightest pretext, these agitators will call a strike and throw a mine idle, and the honest miner must suffer the consequences, because he is helpless to do otherwise than to submit to the will of the majority who are controlled by their leaders, and made to believe that the company does certain things to increase its output of coal and re-

duce the cost at any expense to the miner, whom they represent is the loser in the end. In this belief, the majority of the miners agree to do all they can to oppose the new order of things.

In the case to which I have referred there was provision made for the free services of a doctor, in case of sickness in the family; a premium was paid out of the funds of the society for every birth; an allowance of from 25 to 30c. a day was made to men unable to work for a week on account of sickness; all burial expenses were paid out of the society's funds in case of the death of any member of the family; and, finally, small sums were set aside for the support of poor families or those who had been unfortunate.

The officers of the society were elected from the mine officials and included, besides, three miners who acted on committees. For the support of the society, each miner was taxed 2 per cent. of his earnings, while the company contributed 4 per cent. of the payroll as its share of the necessary support. In addition the fines imposed upon any miner were turned into the society's funds.

A GOOD SOCIETY MISMANAGED BY ITS MEMBERS

All went well for several years, when some persons became dissatisfied, by reason of the fact that the society's funds had increased to about \$16,000. The standing of the society was posted at the mine twice a month, so that everyone knew how the organization stood.

The union leaders called several meetings and denounced the company, charging it with accumulating a large fund to its own advantage. They urged that the society should be controlled wholly by the miners, and that all fines should be abolished. The latter suggestion proved the stronger argument, and the result was that the affairs of the society were managed by men who were controlled by these leaders.

To the disgust of everyone concerned, in eight months the society's funds were exhausted. The abolishment of the fines delighted those who would load dirty coal, but they failed to reap much benefit, as such cars were docked. Also, when a man stayed home, instead of being fined, he was sent back home again when he came to the mine for work the next day.

THE COMPANY AGAIN ASSUMES CONTROL

The men soon began to realize that, instead of earning more money, they were getting less and, worst of all, there was no allowance made for absence on account of sickness; no burial expenses paid; no premiums for births; and no help for poor and destitute families. The drug stores would not honor the orders given by the doctors.

Finally, when the time for another election came, it was seen that the society had a large outstanding debt and not a single miner could be found who was willing to assume the duties of office. Later, the company listened to the appeals of its men and agreed to manage the society as before. The company further agreed to pay all outstanding bills and make good all arrears for sickness. I remember receiving, in 1914, compensation due me for sickness in February, 1912. It will be interesting to know that the trouble makers were discharged from the company's service, although they were regarded by some of the men as martyrs to the cause.

Peru, Ill.

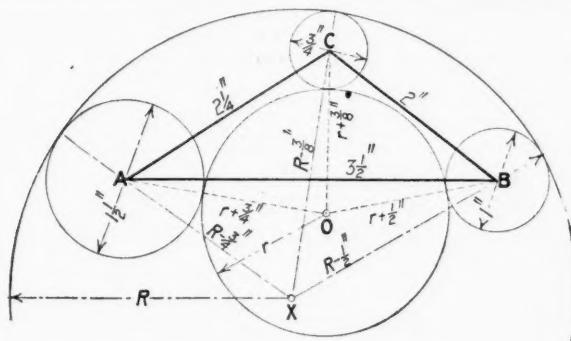
GASTON LIBIEZ.

Inquiries of General Interest

Geometry

For some time past, I have been struggling with a problem that I am exceedingly anxious to solve. Although it is not in direct line with the practice of coal mining, it has an important bearing on my work here, and I would much appreciate a solution. The problem is as follows:

Given three circles whose diameters are $1\frac{1}{2}$ in., 1 in. and $\frac{3}{4}$ in., respectively, and whose centers form the vertices of the triangle ABC, shown in the accompanying



figure, the sides of the triangle being 2 in., $2\frac{1}{4}$ in. and $3\frac{1}{2}$ in. long, as indicated in the figure, the question is to find the radius of a circle to which the three given circles shall all be tangent and lie outside of the same. Also, to find the radius of a circle to which the three given circles shall all be tangent and lie within the same.

Raton, N. M.

D. J. C.

This is a problem in geometry involving the solution, in part, of three triangles ABC, OBC and XBC, having the common side BC, whose length is 2 in. The known factors are the three sides of the triangle ABC. The unknown sides of the triangle OBC are clearly equal to the radius of the inscribing circle, whose center is at O, plus that of the respective given circle, whose center is at B or C. Likewise, the unknown sides of the triangle XBC are equal to the radius of the circumscribing circle, whose center is at X, minus that of the respective given circle.

The first step in the solution is to find the angle ABC from the three given sides of the triangle. Calling the three sides a , b , c , lying opposite the corresponding angles, A, B, C, and the half sum of the sides S , we have, substituting the given values,

$$S = \frac{1}{2}(a + b + c) = \frac{1}{2}(2 + 2\frac{1}{4} + 3\frac{1}{2}) = 3\frac{7}{8}$$

Then, finding the angle ABC, we have as follows:

$$\begin{aligned}\sin \frac{1}{2}ABC &= \sqrt{\frac{(S - a)(S - c)}{ac}} \\ &= \sqrt{\frac{(3\frac{7}{8} - 2)(3\frac{7}{8} - 3\frac{1}{2})}{2 \times 3\frac{1}{2}}} = 0.3172 \\ ABC &= 36^\circ 58'\end{aligned}$$

Again referring to the figure, the second step is to find the center O of the smaller or inscribed circle that will

be tangent to each of the three given circles. Calling the radius of this inscribed circle r , it is necessary to find the angle OBC from the triangle OBC, in which the three sides are $r + \frac{3}{8}$, $r + \frac{1}{2}$ and 2 in. Using the same formula as before and substituting the given values, we have, for the half sum of the three sides,

$$S = \frac{1}{2}(r + \frac{3}{8} + r + \frac{1}{2} + 2) = r + 1\frac{7}{16}$$

Then, substituting this and the given values in the formula for finding the sine of the half-angle gives

$$\begin{aligned}\sin \frac{1}{2}OBC &= \sqrt{\frac{(r + 1\frac{7}{16} - 2)(r + 1\frac{7}{16} - r - \frac{1}{2})}{2(r + \frac{1}{2})}} \\ &= \sqrt{\frac{(r - \frac{9}{16})(1\frac{5}{16})}{2r + 1}}\end{aligned}$$

In like manner it is necessary to find the angle ABO in the triangle ABO in which the three sides are $r + \frac{3}{4}$, $r + \frac{1}{2}$ and $3\frac{1}{2}$ in. In this case we have for the half sum of the three sides

$$S = \frac{1}{2}(r + \frac{3}{4} + r + \frac{1}{2} + 3\frac{1}{2}) = r + 2\frac{3}{8}$$

Again, substituting this and the given values in the formula for the sine of the half-angle, we have

$$\begin{aligned}\sin \frac{1}{2}ABO &= \sqrt{\frac{(r + 2\frac{3}{8} - 3\frac{1}{2})(r + 2\frac{3}{8} - r - \frac{1}{2})}{3\frac{1}{2}(r + \frac{1}{2})}} \\ &= \sqrt{\frac{(r - \frac{11}{8})(1\frac{7}{16})}{3\frac{1}{2}r + 1\frac{3}{4}}}\end{aligned}$$

It is evident from the figure that the difference of the two last angles, OBC-ABO, expressed in terms of the radius of the inscribed circle, is equal to the angle ABC, which was found to be $36^\circ 58'$. Hence, it is necessary to find by trial, such a value for the radius r as will make the difference of these two angles equal to $36^\circ 58'$. A few trials show that the radius r of the inscribed circle is exactly 1.1556 in. This value, substituted for r in the two last formulas, gives for these angles respectively

$$\begin{aligned}\sin \frac{1}{2}OBC &= 0.4098; \quad OBC = 48^\circ 23' \\ \sin \frac{1}{2}ABO &= 0.0995; \quad ABO = 11^\circ 25'\end{aligned}$$

$$\text{Difference... } ABC = 36^\circ 58'$$

The same method is applied for finding the radius R of the circumscribed circle that will be tangent to each of the three given circles. But, in this case, the distances from the vertices of the triangle ABC to the center X of the circumscribed circle are expressed in each case by the difference between the radius of that circle and the radius of each respective given circle, as indicated in the figure. Otherwise, the solution is identical with that just given. The exact radius of the circumscribed circle is thus found to be 2.6893, which substituted in the above formula gives

$$\begin{aligned}\sin \frac{1}{2}XBC &= 0.5511; \quad XBC = 66^\circ 53' \\ \sin \frac{1}{2}ABX &= 0.2581; \quad ABX = 29^\circ 55'\end{aligned}$$

$$\text{Difference... } ABC = 36^\circ 58'$$

It is good mathematical practice for those so inclined to work out for themselves the radius of the circumscribing radius (R) and check the result given here.

Examination Questions

Mine Bosses' Examination in Indiana, September, 1916

(Selected Questions)

Ques.—What factors of safety [safety appliances] should be kept and maintained at the surface landing where miners are being lowered into and hoisted out of a mine?

Ans.—Safety gates should be provided at the surface landing of all shafts where men are lowered or hoisted. The gates should be operated automatically by the rising or falling of the cage in the shaft. At the head of all slope openings, safety blocks and derailing switches should be maintained to prevent cars from running down the slope before they are attached to the rope. At all mine openings, an efficient signal system should be maintained and a checkoff board that would show what men are in the mine. All manway openings or slopes accessible to the men should be locked or otherwise guarded to prevent anyone from entering the mine who is not authorized.

Ques.—(a) What effect does a misplaced shot have in the presence of firedamp? (b) In the presence of coal dust? (c) What method would you adopt to protect surplus powder?

Ans.—(a) A misplaced shot is one in which the charge is either given no opportunity to perform its work in breaking down the coal, or the amount of charge is too great for the work to be performed. In the first case the explosion of the charge will generally blow out the tamping instead of breaking down the coal, and a flame of high temperature will be projected from the mouth of the hole, throwing much dust into the atmosphere and possibly igniting the dust clouds or any gas that may be accumulated in the place, thereby causing a local explosion that, under certain conditions, may be propagated throughout the mine and result in a mine explosion. The same results may follow when the charge of powder is greater than that required to break down the coal. In that case much of the unburned powder is blown into the air and exploded, causing a windy shot. The force of the explosion is thus expended, to a greater or less extent, on the mine air and produces the results just explained.

(b) Where coal dust is present, in proximity to a blownout or windy shot, the dust is thrown into the air by the force of the explosion and ignited by the flame of the blast, causing a local dust explosion that may or may not be propagated throughout the mine, depending on the condition of the workings and passageways in the mine.

(c) No surplus powder should be taken into the mine. Each miner should be permitted to carry into the mine only sufficient powder for his use in that shift. This should be carried in a metallic canister or other sealed receptacle.

Ques.—How would you determine the quantity of air passing in an airway 8 ft. 2 in. wide at the bottom, 6 ft. 8 in. at the top and 5 ft. high? How many readings would you take at a given point? Where would you take

the readings and how would you find the amount of air passing?

Ans.—Assuming the dimensions given are in the clear, the sectional area of the airway is found by multiplying the half-sum of the top and bottom widths by the height of the airway. In this case the half-sum of the top and bottom widths is $\frac{1}{2}(14 \text{ ft. } 10 \text{ in.}) = 7 \text{ ft. } 5 \text{ in.}$, or, say 7.4 ft.; and the sectional area is therefore $5 \times 7.4 = 37 \text{ sq. ft.}$

In order to estimate the quantity of air passing in the airway it is necessary to first find the average velocity of the air current for the entire cross-section of the airway, remembering that the velocity is greatest in the center of a straight airway, being less where it rubs along the ribs, top and bottom of the passage. It is always better to take readings in a comparatively straight section of the entry, as the velocity of the air will vary in the bend of an entry, being greater on the outer rib of the bend. At times, the velocity will be found to be greater at the roof or at the floor of an entry, depending on conditions of temperature.

In order to obtain an average reading, the anemometer should be held an equal number of seconds at different points in the cross-section, so as to get readings at short distances from the roof, floor and each rib, and in the center of the section. If five such readings of 12 sec. each are taken in an entry, the aggregate reading will more or less closely represent the average velocity of the air current in feet per minute.

It must be remembered, however, that any readings taken with the anemometer are more or less approximate, and the body of the observer necessarily takes up some of the area of the cross-section and makes the observed velocity somewhat greater than the actual amount. For this reason, the judgment and experience of the observer must dictate the method to be pursued in any given case. Having obtained the average reading expressing the velocity of the current in feet per minute, multiply this by the sectional area of the airway at the point of observation, and the product will be the quantity of air passing in cubic feet per minute.

Ques.—How, in your opinion, should a mine boss examine the room of a miner's working place to comply with the law? How should he proceed? State fully.

Ans.—Sec. 33 of the Indiana Mining Laws requires the mine boss to visit and examine every working place in the mine at least each alternate day, while the miners are or should be at work. He must see that each place is properly secured by posts and that it is safe for work; also, that there is a sufficient supply of props and other timber on hand in the working places and that all loose coal, slate and rock overhead are carefully secured. The judgment of the mine boss and his knowledge of the local conditions must largely decide the question of the safety of the roof in a working place, and a most careful inspection of the roof is necessary in order to determine its true condition. The simple sounding of the roof is not sufficient and is often misleading and deceptive.

Coal and Coke News

Washington, D. C.

Senator Newlands, chairman of the Senate Interstate Commerce Committee, before which is the Webb bill authorizing the creation of export combinations, announced last week that hearings will be held on that measure before a report is made to the Senate. No date has been selected as yet for the hearings but it is anticipated that they will not begin until after the holiday recess. The Webb bill is of great importance to the coal interests of the United States, as pointed out by the Federal Trade Commission, a review of which report was detailed in this correspondence last week. The measure stipulates that the Sherman antitrust law and the new Clayton act shall not be interpreted as forbidding the creation of combinations or agreements among domestic producers for the purpose of carrying on export trade nor shall these laws forbid the organization of joint foreign selling agencies by domestic corporations.

Under such a plan as would be legal under the Webb bill the domestic producers of coal could combine for the creation of a complete export mechanism for the purpose of selling coal in foreign countries. The bill has already passed the House and requires but the ratification of the Senate. An attempt was made at the previous session of this Congress to attach the bill on an appropriation bill in the Senate but opposition developed and the plan was abandoned for the time being. At that time it was stated that Senator Reed of Missouri was opposed to the bill as was Senator La Follette and other progressive republican senators. These opponents threatened to filibuster if the measure was pressed at that time.

The opposition continues but the administration leaders are hopeful that it can be battered down and the measure passed before the adjournment of this Congress Mar. 4 next. President Wilson has recommended its passage in his annual message to Congress. The Webb bill will not, however, be pressed for a short time, because the Senate Interstate Commerce Committee has more important matters before it. This committee desires first to put through the emergency railroad legislation designed to supplement the Adamson 8-hr. law. This includes a provision of law permitting the President to take over the railroads and operate them in case of an emergency, and a bill amending the mediation and conciliation act which would forbid leaders ordering a strike until a public investigation can be made of the labor conditions over which the dispute had arisen.

This latter legislative proposal is of great importance to the mining interests inasmuch as it may follow that the proposed amendment to the mediation act will sooner or later be applied to strike conditions in the coal-mining industry. The amendment in brief proposes that when all attempts at mediation and conciliation fail, the Federal Government may direct a public investigation of labor conditions which has incited the dispute between employee and employer. While this investigation is going on the leaders on either side would be restrained by law from issuing a strike or lockout order.

This legislation has received the endorsement of a special committee of the United States Chamber of Commerce. The report of this committee pointed out that the national chamber last summer recommended that the Interstate Commerce Commission be given authority to investigate the labor conditions. It calls attention to the fact that the legislation as recommended by President Wilson and sanctioned to date by the action of the Senate Committee on Interstate Commerce should be passed. In order, however, that the business people all over the country shall be given an opportunity to express their views, the national chamber has asked for a referendum vote on the proposal by its constituent organizations. The result of this referendum, it was announced, should be known in January.

Railroads Need Not Furnish Special Cars

According to a decision handed down by the Supreme Court recently, the Interstate Commerce Commission has no authority to compel a railroad to furnish cars of a particular type merely because a shipper on its lines uses that type of car in making shipments. This decision is of great importance to the coal operators inasmuch as it is interpreted to mean that the Commission may not direct a road to build and equip itself with coal cars to satisfy the needs of mines on its line.

The decision was handed down in what is known as the tank car case. The Interstate Commerce Commission ordered the Pennsylvania R.R. to furnish upon request certain types of tank cars to the Crew-Levick Co. and the Pennsylvania Paraffine Works, both of which are Pennsylvania corporations. The railroad appealed to the courts, winning in the State of Pennsylvania.

The Interstate Commerce Commission appealed to the Supreme Court, the United States intervening in its behalf in one case, and the Crew-Levick Co. and the United States appealing with it in a second case. The Supreme Court sustained the decision of the lower court.

Drastic regulations and increased demurrage and rental charges on freight cars went into effect last week, without inciting the disapproval of the Interstate Commerce Commission. These rules and charges were proposed as an emergency measure to relieve the shortage of freight cars which for months has been a brake on the country's commerce and an important factor, it is believed here, in the advance in coal prices.

The remedy is the railroads' own measure proposed by the car service commission of the American Railroad Association and formally approved by the Interstate Commerce Commission. The first regulation provides that a consignee may have the actual two days to unload a car and that thereafter demurrage shall be charged at the rate of \$1 for the first day, \$2 for the second, \$3 for the third and \$5 for the fourth and each succeeding day. Heretofore the charge has been uniformly \$1 a day, and many consignees, it is charged, notably coal dealers, have been glad to permit shipments to stand for long periods because the penalty was so small that it compared favorably with warehouse charges.

Another order increases the daily rental paid by railroads to one another for cars from 45 to 75c. per car, or about 70 per cent. Some Eastern roads are said to have from 5,000 to 10,000 foreign cars of a single type. Foreign cars on congested roads are said to have come almost wholly from Southern and Western roads. Reports to the Interstate Commerce Commission show that they glut the railroad yards and sidings of most Eastern lines and many in the Middle West. The trend of traffic, because of the European demand for American goods, has been overwhelmingly toward Eastern seaports.

The rise in the price of coal is attributed almost wholly to the car shortage, aided by the alleged activities of speculators. While the East was paying panic prices for coal the mines of the Middle West, and, to less degree, of the anthracite section, were working with reduced forces or on part time, in many instances, because there was not a sufficient supply of cars to handle the output. An order for the return of coal cars to their owners, loaded or empty, was issued several weeks ago by the car service commission to meet this condition.

In railroad yards of the Middle West the relief of congestion, under these related orders, is said to have been marked. Thus at Detroit, within a month the number of loaded cars in the railroad yards awaiting unloading is said to have fallen from 25,000 to 15,000. Further consideration of the problems presented by the shortage of cars will be considered shortly by the executives of the Eastern roads, it was announced here.

HARRISBURG, PENN.

A series of radical changes in the provisions of the State Workmen's Compensation Act relative to medical and surgical matters was suggested to the State Compensation Board on Dec. 14, by a committee headed by Dr. J. B. McAllister, president of the State Medical Society, and representing that organization, the State Homoeopathic Medical Society and the State Electric Medical Society. The committee discussed the proposed changes with the members of the board and a further meeting will likely be arranged. The state administration has not yet announced its policy in regard to the compensation acts during the coming winter, but at the recent Industrial Welfare and Efficiency conference there were expressions in speeches in favor of retaining the act for a further test of two years.

The amendments proposed by the medical men were as follows:

"Creation of a permanent medical advisory council of three medical men, representing each of the three recognized schools of medicine in the state to act upon all medical and surgical questions that may be appealed from the board's decisions."

Employment by the state of a consulting physician and surgeon who shall not have any other governmental affiliation, nor any with corporations or employers, to prepare questions to be laid before the board.

Making the board a court of appeals on matters in dispute regarding services of physicians and that all medical matters on appeal be referred to the medical advisory council.

Changing the period of disability for medical attention from 14 to 30 days, the date of disability to be fixed from the time the patient reports for treatment.

Elimination of the words 'major operation' from the act and amending it so as to provide for

increase of the maximum of medical or surgical and hospital services to \$200 and to allow a sliding scale of fees, the rates of charge to be in accord with those the physician in charge is accustomed to receive from other members of the same community or the same standard of living in his community. The fees to be paid to the attending physician."

Favorable expressions were heard regarding the suggestions and in all probability the matter will be taken up with the governor and attorney general.

Long-Standing Injunction Modified

Judge C. N. Brumm, of Schuylkill County, filed an opinion and issued a decree recently modifying a long-standing injunction by giving the Thomas Colliery Co. permission to mine nearly 1,000,000 tons of coal under the borough of Shenandoah, of a market value of more than \$3,000,000. The tract is owned by the Girard Estate and leased by the Board of City Trusts to the Thomas Colliery Co.

The proceedings were begun in 1904 and in 1911 the court issued an injunction prohibiting the mining of coal within a vast area under the main portion of Shenandoah. This was effective until the court filed its decision.

The Home Brewing Co., of Shenandoah, was the chief complainant, but Archbishop Prendergast also intervened because St. Casimer's Church, valued at \$80,000, is in the danger zone. The walls and foundations of the brewery have been cracked. Large sums of money were spent in the case. It was believed the surface was in danger of collapsing if there should be further mining.

Judge Brumm in his decision provides against cave-ins, ordering the coal company to fill the cavities caused by new mining by slushing and gobbing. By this process it is believed the entire overlying strata will be protected. If there is any additional cracking of the surface all mining is to cease until further order of the court.

The order applies to the big and little Buck Mountain veins, idle for nearly a decade, the 7-ft. vein and part of the Skidmore vein. All the coal in the top and bottom split of the Skidmore and Mammoth veins within a specified area about the brewery is not to be mined. Judge Brumm's opinion reflects the views of mining experts as to the manner in which coal mining can be conducted under populous towns without affecting the surface.

There is deep interest in the decision of the lower court, as it upholds the right of lateral support from mine caves.

The brewery and the church are over the workings of the Philadelphia & Reading Coal and Iron Co., and the prescribed area is over the workings of the Thomas Colliery Co. Vertical support was not sought in the injunction so that the Philadelphia & Reading Coal and Iron Co. was not a party to the case, and the deeds under which the brewery and church property are held were not in question, as to waivers or other clauses.

The brewery charged that if the Thomas Colliery Co. mined coal adjacent to the brewery, it would cause caves, hence lateral support was asked and granted.

The decision means that the company even though it does not own the coal under the brewery and never had dealings with the brewery or church people cannot mine adjacent coal if such mining is to cause damage to the brewery and church property. The decision also goes so far as to practically confiscate the coal in three veins, by prohibiting mining of those beds.

In the lower veins, if mining is done, the worked out places must be slushed and caged.

PENNSYLVANIA

Anthracite

Lansford—The Lehigh Coal and Navigation Co. announces that it desires to increase its output and will pay to the employees directly connected with the handling of coal, laborers, transportation and breaker men on whom it relies for cooperation, a bonus for increased output. The bonus system is operative at all its mines and breakers, and is made effective for the last half of November. Each man connected with the loading, transportation and preparation of the coal will receive 10c. a day bonus. Beginning Dec. 1, a premium will be paid of 10c. a day per man when the average dump for the two-weeks period equals the basis established. For each car per hour increase over this basis the men will receive an additional bonus of 1c. per hour. The announcement of Dec. 15 says further: "This will be paid for the first half of December, irrespective of the Saturday half holidays, but for the last half and up to the first of April, each Saturday will be considered an 8-hr. day whether the men remain at work or not, and the same action will be taken in case of button strikes or other stoppages in violation of the contract of May 5, 1916. This is

Intended as an experiment, and will be effective until Apr. 1, 1917."

Shamokin—A transfer of local mining interests was consummated on Dec. 14, when the Colbert colliery, operated by the Shipman company, headed by John D. Corliss, Detroit, Mich., was purchased by a syndicate, headed by B. F. James, of Shenandoah. The colliery employs 500 men and boys. The purchase price was not made public. The plant is one of the best in the region. Mr. James is a practical mining man and has numerous coal and slate quarrying interests.

Dritton—The 4,000 children of the miners at the collieries of Coxe Bros. & Co., Inc., will receive gifts of clothing, toys and sweets from Mrs. Eckley B. Coxe, widow of the anthracite operator, at their respective school houses on the afternoon of Dec. 21. Mrs. Coxe has been Santa Claus to the boys and girls at the mines for nearly half a century.

Scranton—With the completion of a tunnel or gangway that is being driven from the Pine Brook shaft to a point under the vicinity of court house square, the Scranton Coal Co. will begin mining out the coal under the central city. Three veins are to be mined. It is stated that no damage will be done to the surface as there is good roof over the coal. The tunnel has now reached a point approximately under the administration building of the International Correspondence Schools in the 400 block of Wyoming Ave.

An order fixing the valuation of coal lands in Lackawanna County for assessment purposes at \$500 per foot acre, was handed down on Dec. 14, by the court. This is a decrease of \$25 from the valuation as fixed by the county commissioners and an increase of \$125 per foot-acre over the rate that has been in effect since 1913. The new rate will be in force for three years. It is assumed that the coal companies will carry their fight to the higher courts.

South Scranton—Spruks Bros., lumber dealers and independent coal operators, and their associates, who during the past few months have acquired control of a number of small mines in and about Scranton on Dec. 15 purchased the Carleton Coal Co. from John Gibbons and others. The consideration is said to have been close to \$50,000. The Spruks Bros. will probably operate this colliery themselves in connection with their other operations in this vicinity.

Hazleton—It has been estimated by officials that the Lehigh Coal and Navigation Co. has expended about \$50,000 so far on the electrification of the Cranberry colliery, which when all the plans for installing power are completed will cost upwards of \$300,000.

Pottsville—The storage yards of the big anthracite companies located nearby are almost entirely empty owing to the heavy shipments which have been made during the past three weeks. At the Landingsville yards on the side of a mountain 4 mi. south of here the Philadelphia & Reading Coal and Iron Co. is preparing to increase the capacity materially by the addition of four more storage piles. Of course no coal can be placed in the yard until summer when the demand for fuel falls off.

The Myrtle Coal Co., of Pottsville, headed by E. J. Taylor has leased a million tons of culm in the vicinity of Pottsville for the purpose of manufacturing brickettes.

BUTTERMINES

Waynesburg—J. V. Thompson, of Uniontown, recently accepted options on two farms of 300 acres each in Jefferson Township, Greene County, the price per acre being \$400. This coal is in the same district as the 12,000 acres recently purchased by the H. C. Frick Coke Co., and it is believed that this block will be added to the holdings of that firm.

Pittsburgh—Increased activity is noticed among coal-land brokers, and much coal property around Pittsburgh has been optioned for sale and several big transactions are reported under way. The present coal market is leading to the development of a number of new mines.

It is estimated that fifty million tons of coal will have been consumed in the Pittsburgh district in 1916. This represents an increase of over seven million tons over the preceding year. It is expected that the consumption for 1917 will be even greater if the coal companies are successful in getting cars to handle their product and men to mine it.

Connellsville—The estimated coke production for the Connellsville region for the week ending Dec. 9 was placed at 424,756 tons, of which the merchant ovens produced 163,962 tons and the furnace ovens 260,803 tons. This shows a gain of 17,629 tons over the previous week.

Notices were posted at the plants of the H. C. Frick Coke Co., throughout the coke region on Dec. 15, announcing an increase of 10 per cent. in wages. Approximately 40,000 men are affected. This is the third increase for the coke workers this year. Independent companies are expected to meet the advance.

Washington—A tract of coal land containing between 300 and 400 acres, formerly operated by the Dilworth Coal Co., has been purchased by the H. C. Frick Coke Co., from the Lincoln National Bank, of Pittsburgh, which came into

possession of the property when the Dilworth company failed. The price paid was not made public. The tract is on the Monongahela River and lies between the big block of land purchased from J. V. Thompson creditors' committee last week by the Frick company and 2,067 acres previously held by the company.

Russell—While drilling for oil, drillers recently struck a 9 ft. bed of coal, the largest ever found in Warren County. The only coal mine in Warren County is located near Scandia, but the seam is only 18 in. to 2 ft. thick. A Jamestown, N. Y., firm which holds the lease on the oil rights on the property where the coal was found, also holds a lease for the mineral rights.

Johnstown—Coal operators from all sections of Cambria, Somerset and Indiana counties assembled on Dec. 14 to perfect plans for establishing a mine rescue and safety station and to effect a permanent organization. Charles Owens was elected president of the new body. It was decided that the new rescue station should be established near the mines of the Valley Smokeless Coal Co. at Ferndale, a short distance from this city. This was estimated as being the center of the district to be embraced by the new organization. It is believed that any mine in the district can be reached from the station in two hours. An expert mine-rescue man will be placed in charge of the depot, which will be equipped with modern apparatus. The operators will meet several times each year.

WEST VIRGINIA

Charleston—Coal operators of the Kanawha Valley are of the opinion that heavier shipments of coal will have been made this fall than in any previous season. The importance of the river in connection with the coal industry was not fully appreciated by many of the operators until there was a shortage of coal cars, necessitating the making of many shipments by water. More tow boats are now operating on the Kanawha than ever before.

The recent heavy snow fall is expected to further affect the coal industry in West Virginia. Lack of motive power on the Chesapeake & Ohio R.R. has caused many loaded coal cars to be held for days. The weather is expected to reduce the tonnage movement at least 25 per cent. Reports are that at some places nearly all the tracks in the yards are filled with cars loaded with both coal and merchandise.

Within the recent past detectives have been stationed by many of the railroads and other big coal consumers at various tipplers in this section of the state for the purpose of checking up the shipments of those operators behind in their coal orders on account of the car shortage, and see that the contracting parties live up to their agreements as far as possible. Higher prices for coal in the general market places the temptation before the operators of disregarding contracts and selling coal for spot prices, placing the blame on the shortage of cars.

Huntington—The Cabin Creek Valley, which last August was devastated by a flood, has approximately recovered. Only a small percentage of the many people whose homes were destroyed by the floor waters left the district permanently, and some of these have returned as the valley's rehabilitation has progressed.

ALABAMA

Birmingham—The Imperial Coal and Coke Co. has taken steps for the rehabilitation of 103 beehive ovens at Bradford, near Birmingham, on the Louisville and Nashville R.R. These ovens have not been in operation for several years, and it is understood that the Imperial Coal and Coke Co. has secured a contract for a large tonnage of coke for Mexican smelting interests, which necessitated the placing of these ovens in blast.

Gilmore—The Debardeleben Coal Co. has taken over the property of the Tuscaloosa Export Coal Co. at Gilmore, about 45 mi. from Birmingham, located on the Warrior River and the Tuscaloosa Mineral Branch of the Louisville and Nashville R.R., and is making extensive improvements with a view of bringing the production up to 20,000 to 25,000 tons per month. There are seven drift openings on this property on the Brookwood seam, and the coal will be delivered directly to barges and shipped to New Orleans and Mobile. The Debardeleben Co. has extensive bunker coal contracts at these ports, and on account of inability to secure cars for the movement of coal from its Sipsey mines to the barges on the river, has experienced great difficulty in making stipulated deliveries, and was forced to make the developments at "Warriver," as the entire output at the new mines will be transported by water.

Edgewater—It is reported that about 80 men were entombed in the Edgewater mine by an explosion on Dec. 20. This explosion occurred early in the morning shortly after the men entered the mine.

KENTUCKY

Whitesburg—Three transports of 100 men each have arrived in the Fleming-McRoberts coal fields in this (Letcher) county where they will be employed in the mines. Operators are experiencing little trouble in getting labor.

The Louisville & Nashville Railroad Co. reports large increases in coal shipments from the Elkhorn and Bonde's Fork fields within the past two weeks.

Praise—The Excelsior Coal Co. is increasing shipments from its new plant on the Carolina, Clinchfield & Ohio R.R. Beginning the first of the year it will increase to 1,000 tons daily.

Jenkins—Three workable coal beds have been opened by a party of prospectors in the Cumberland Mountains near Elkhorn Creek in the Elkhorn coal fields. W. J. Christopher led the prospectors. This refutes the argument that there was no coal of workable thickness in the Cumberland. It is expected that the Consolidation Coal Co. will develop the property.

OHIO

New Marshfield—Supt. Moore has a force of men at work pumping out and otherwise placing in good condition the mine at Luhrig, and efforts are to be made to place the operation in working shape as soon as possible.

Athens—The sale of the properties of the Continental Coal Co. in the Hocking field, scheduled to take place Dec. 9, as the result of a suit in foreclosure brought by the Guaranty Title and Trust Co., New York, was postponed until Dec. 23. The minimum bid that will be considered is \$500,000. These properties are now being operated by N. D. Nonsarrat, receiver.

Rayland—All the coal mines in Warren Township are only running about half time on account of the shortage in cars. They have many orders for coal which cannot be filled.

INDIANA

Bruceville—Two miners were killed and 15 injured as the result of a gas explosion in the Olyphant-Johnson mine near here Dec. 19; one hundred and fifty men were entombed by the blast. Some of the men were imprisoned for nearly four hours, but by means of extra ventilating apparatus, the supply of fresh air to the workings was never shut off.

Terre Haute—Mayor James Gossom has ventured farther into the municipal coal business and has already delivered the first load from the new city field north of West Terre Haute, a small town about four miles west of Terre Haute. There Mayor Gossom has opened a strip mine and in a few days after obtaining it the first load was delivered. Orders are continually being filled from the other municipal mine and the city council is seriously considering going in with the county commissioners and purchasing lands to provide city and county institutions with fuel.

Farmersburg—The old Rood mine property has been sold by J. Hurley Drake, the principal controlling party, to the Farmersburg Coal Co., composed of George Anthony, David R. Scott and Ralph Sharp, all experienced coal men. The work of opening the shaft will begin shortly.

ILLINOIS

Sparta—Coal mines along the M. & O. have a hard time getting more than one day's supply of equipment per week for commercial coal loading. While the mines work more than one day a week, as a rule the remainder of the coal is for railroad use. It is reported that the cars for the large tonnage of coal moving south from East St. Louis over the M. & O. received from mines on the Southern Railway near Belleville is furnished by the M. & O., and that the coal goes to a connecting road in the South, which has no equipment of its own. Thus, operators on the M. & O. are forced into suspension by what they deem an unwarranted invasion of their rights.

Springfield—Mayors and city officials from 35 Illinois cities met here recently, discussed the high cost of coal and adopted resolutions recommending that Gov. Lowden in his message to the next Legislature ask for a law providing for state supervision of the coal industry. The passage of a bill giving municipalities the right to purchase and operate mines was advocated and it was urged that a campaign of education be carried out in each city with the object of having small consumers buy their coal in May June or July, when the prices are lowest. From the information presented at the meeting the conclusion was reached that there is no serious car shortage and the cost of production is no greater than a year ago. Duncan McDonald, secretary-treasurer of the Illinois Mine Workers, in an address to the officials, declared that the increased price of coal was not caused by increased wages. He declared that 70 per cent. of the mines of Illinois were owned by railroads and that the cost of producing a ton of coal is \$1.20 in most of the mines of Illinois. The conference adjourned to meet at the call of the chairman, W. K. Abbott, Mayor of Quincy.

Duquoin—The entire southern Illinois coal field was idle on Dec. 12 on account of the miners' election. Something over 25,000 miners were idle. There was an effort on the part of the operators to induce them to work at least a half a day. It was estimated that the loss of tonnage on account of this idleness for one day was approximately 100,000 tons.

De Soto—Several testing outfits are at work drilling in the territory north of here and close to the Perry County line. Several tests have been made near the outcrop of the seam northwest and northeast of here, and the presence here of representatives of strip operators in the southern Kansas field gives color to the report that the coming spring will see big coal stripping operations near here.

Logan—Eight miners were seriously injured in an explosion here this week. It is supposed that one of the miners worked into a gas pocket, which became ignited. Twenty-five other miners suffered slight injuries. The eight men were brought to St. Louis, where on the 15th one of them died. The other seven are expected to recover.

Herrin—The estimated tonnage for the mines of Williamson County for the first 14 working days of December is 296,000 tons. The biggest tonnage would have gone to the Johnston City Coal Co. but for an accident. This mine is the greatest producer in the county going neck and neck with the Peabody mine. The Squirrel Ridge mines got the best showing for the first half with 30,586 tons.

Pleasant Plains—The Citizens Coal Mining Co. has opened war on the big operators in the Central part of the state by selling coal at 10 cents a bushel. The company is getting more orders than it can fill. Several dealers of Jacksonville, where coal has been selling at 22 cents, have made contracts with the Citizens' company for its output.

Auburn—A record was established here Dec. 9 when 915 pit cars were hoisted out of the Old Crow shaft, owned by Louis Senseny.

KANSAS

Pittsburg—Twenty miners were killed and seven injured in a recent explosion at the Reedy & Ryan coal mine at Stone City. It is believed to have been a combination gas and powder explosion, but the mine experts have not yet been able to penetrate the mine to make a thorough examination.

OREGON

Salem—State Labor Commissioner Hoff recently named James Bagley as a mine expert to go to Marshfield and investigate the conditions existing at the Beaver Hill mine, where three men lost their lives in an explosion some weeks ago. Circumstances surrounding the explosion will be investigated as well as recommendations made relative to plans to be executed for avoiding similar accidents in the future.

Personals

C. R. Stahl, chief engineer for the E. E. White Coal Co., has been appointed assistant to the general manager.

D. L. Sacks, who for the past five years has been associated with the St. Louis Branch of H. W. Johns-Manville Co., has now taken charge of the advertising department of the Walter A. Zelnicker Supply Co.

F. F. Tilden, formerly city salesman at the Indianapolis branch of the Goodyear Rubber Co., has been installed as manager of the branch at Columbus, Ohio, succeeding W. W. Magill, whose duties are to be announced later.

Rice Miller of Hillsboro, Ill., has been elected vice-president of the Illinois Coal Operators' Association. The vice-president elected at the October meeting of the association declined to serve and Miller was elected at a special meeting.

S. P. Hutchinson, of Philadelphia, president of the Westmoreland Coal Co. and the Penn Gas Coal Co., both operating in Westmoreland County, Penn., recently spent several days visiting the operations of his company, and also in Pittsburgh.

S. B. Taylor, sales manager of the S K F Ball Bearing Co., of Hartford, Conn., has been appointed vice-president of the company succeeding F. B. Kirkbride, who remains on the board of the company. Mr. Taylor will remain in charge of sales.

John R. White, for many years manager of the Valley Coal Mine at Belleville, Ill., died Friday, Dec. 15, at St. Elizabeth's Hospital in that city, at the age of 59 years. Death was caused by pneumonia. He is survived by his wife, three sons and three daughters.

T. F. Donley, formerly in charge of the accounting department of the Keystone Coal and Coke Co., has resigned to take over the interests of his brother, the late Martin Donley, in the Delaware River Lightering Co. and the Schuykill Transportation Co.

C. J. Roy, of Myersdale, Penn., has resigned his position as general superintendent of the Brothers Valley Coal Co., and accepted the presidency and general management of the McGregor Coal Co., recently organized. This firm has purchased and put in operation what is known as the old Bando mine on the Baltimore & Ohio R.R. between Somerset and Rockwood, Penn.

H. M. Wolflin has been designated by the U. S. Bureau of Mines to succeed Edwin Higgins, in charge of the California co-operative work of the Bureau and the Industrial Accident Commission. Mr. Wolflin had charge of this work from January, 1914, to January, 1916, during which time he made a preliminary survey of mine safety conditions in the state and assisted in drafting the Mine Safety Rules. When Mr. Higgins' resignation as chief mine inspector became effective Mr. Wolflin made a request of the Bureau of Mines that he again be assigned to take charge of the work. The Industrial Ac-

cident Commission has appointed Mr. Wolflin chief mine inspector.

Edwin C. Curtis of Nanticoke, Penn., safety inspector for the Susquehanna Coal Co., was on Dec. 15 appointed a State mine inspector for sub-district No. 9 with headquarters at Pittston, Luzerne County, to fill the vacancy caused by the resignation of S. J. Jennings. The appointment is to fill the existing vacancy for the term ending the first Monday of January, 1917. Mr. Jennings resigned as inspector last October to take a position as superintendent for the Delaware, Lackawanna & Western Railroad Co.'s coal department, but as his name was on the ballot as a candidate for reelection as mine inspector at the time he was reelected last November for the ensuing term. He will now have to resign again for the term to which he has been elected, which will necessitate the reappointment of Mr. Curtis.

Industrial News

Scranton, Penn.—H. McKean Conner, consulting mining engineer, recently announced the removal of his office to Room 1102, Union National Bank Building, Scranton.

South Bethlehem, Penn.—President E. M. McElvane of the Lehigh Coke Co., has announced that effective Dec. 16 all employees will receive an increase of wages amounting to 10 per cent.

Johnstown, Penn.—The Manor Real Estate and Trust Co., of Philadelphia, has sold to the Indiana-Moshanon Coal Co. six tracts of mineral in Greene Township of Indiana County, the consideration being \$99,470.

St. Louis, Mo.—Twenty stills have been shut down at the Standard Oil Refinery at Wood River, Ill., because of a coal shortage. In some stills crude oil is being used as fuel. Part of the plant has been shut down.

Stotisbury, W. Va.—The E. E. White Coal Co. will shortly complete its new concrete drift at No. 5 mine. This firm recently let a contract also for 20 new dwellings, ranging from four to six rooms. These houses will be modern in every respect.

Buffalo, N. Y.—A large force of men is putting the Tonawanda iron and steel works of Rogers Brown & Co. into running order and it will start up in a few days, after being idle several years. Difficulty in getting a supply of coke at first made it seem impossible to resume.

Virgen, Ill.—The Old North mine, controlled by the Montour Coal Co., will soon be hoisting coal. This will be the first operation at this mine since the engine and boiler house burned in January, 1915. It is also reported that the mine at Green Ridge, formerly the O'Gara No. 27, is about to resume operation.

Wheeling, W. Va.—An order was recently entered in the Federal Court restraining several trustees from selling certain coal lands belonging to J. V. Thompson, of Uniontown, Penn., located in Monongahela County, W. Va. A stay has been granted until Jan. 9, to permit an appeal to the United States Supreme Court.

Carlinville, Ill.—The 100-ton bin for local coal trade of the Carlinville Coal Co. is nearing completion, and is expected to be ready for use by the first of the year. This installation is being made by the Link-Belt Co. The coal company has also purchased a 3-ft. Jeffrey fan, delivery and installation of which is expected in the near future.

St. Louis, Mo.—A municipal coal yard was opened one day last week in Granite City. Coal was retailed at 12½ and 15 cents a bushel, the latter price including delivery. Local dealers who had been asking 18 cents immediately came down to 15 cents. The city gets its supply through a big manufacturing concern, which has a contract with a mine.

Benton, Ill.—It is generally understood here that the negotiations that have been going on by the U. S. Steel Company for the purchase of the properties of the Middle Fork Mining Co. near here have been consummated. The transaction involves several hundred thousand dollars, and the plant is the last word in coal mining construction and equipment.

Scranton, Penn.—The Delaware, Lackawanna & Western Railroad Co. has notified the residents of an entire block in West Scranton that it intends to remove the coal pillars beneath their homes within the next two months. Among the property owners affected are W. E. Watkins and E. H. Evans, mine foremen for the company, together with R. A. Phillips, a former general manager.

Cincinnati, Ohio—Three towboats bound for Cincinnati recently lost 15 of their barges of coal while attempting to pass the foot of Manchester Island. One of the boats is the "Plymouth," belonging to the Hatfield company of Covington, Ky. Local coal men estimated that each of the barges contained 350 or 400 tons of coal, and that the total value of the lost fuel would be between \$15,000 and \$20,000.

Norton, Va.—Surveying for the extension of the Interstate R.R. from Norton to the Black Mountain Coal operations near the Kentucky-

Virginia state line, was recently completed, and work of construction is expected to begin as soon as the report of the engineers is in. Two routes were surveyed, one along Guest River from Norton, and the other from Dorchester Junction along the bed of Powell's River.

Columbus, Ohio—Interurban service must be maintained by the Hocking Valley Railroad between Hamden and Jackson, although the company maintains that this is not profitable. The Supreme Court refused to disturb the order of the State Public Utilities Commission which decided the case, saying in effect that the new conditions have not been in effect long enough to determine on merit whether the railroad company's claims are well founded.

Pittsburgh, Penn.—Threatened by shut downs during the winter months on account of a shortage of natural gas, manufacturers in the Pittsburgh district have been conducting experiments with coal dust. They assert their experiments have proved that the dust can be substituted for gas. The Carnegie Steel Co. is using coal dust at 32 of its 80 open-hearth furnaces in this district. It is estimated the use of this fuel will mean a saving of 21,000,000 cu. ft. of gas daily. While the coal dust is not so cheap as natural gas, yet it is being furnished manufacturing plants here at a cheaper rate than consumers' gas.

Columbus, Ohio—Damages amounting to \$150,000 are sought by the Sunday Creek Coal Company in a suit filed in common pleas court against the New York Coal Company. Confiscation of machinery and equipment worth that much, which the Sunday Creek Company had installed in an Athens County mine, leased from the defendant, is charged. In bringing the action the Sunday Creek Corporation turned the tables on the New York Coal Company, which already has recovered approximately \$30,000 from it as royalties which it failed to pay on leased coal fields in the Hocking Valley. Several such suits still are to be heard.

St. Louis, Mo.—Mines on the Belleville and Lebanon divisions of the East St. Louis & Suburban Electric Railway Co. are being worked at 90 per cent. of their capacity during the car stranding on the railroads. The company does not permit its cars to get away and has done much to relieve the shortage in St. Louis and East St. Louis. The mines on the line are the West Virginia Coal Co.'s St. Ellen mine, the Prairie Coal Co.'s Prairie mine, the Southern Coal and Coke Co.'s old Avery mine, the Superior Coal Mining Co.'s Superior mine, and the Boehmer Coal Co.'s Suburban mine. All of these are now working day and night shifts.

Columbus, Ohio—Considerable trouble has been created among manufacturing plants of Columbus and in fact all parts of Ohio from natural gas distributing companies, turning off gas from many plants. The gas companies say that they must conserve their supply for domestic usage. Managers of manufacturing companies affected call attention to the fact that during the summer they are solicited by gas companies, and assurances are given that the gas will never be turned off. Many thousands of men have been thrown out of employment because of the turning off of the gas. A meeting of manufacturers with representatives of the Columbus Chamber of Commerce has been arranged to discuss the situation.

Columbus, Ohio—Loss of coal by theft and from rocking of coal cars on curves, formerly considered more or less as a minor thing, has taken on a new seriousness in view of the high price of coal and the shortages that exist throughout the West. To abate the nuisance and save as much loss as possible the railroad companies of the West have adopted an inexpensive and effective plan. Before leaving the railroad yards all cars of coal are whitewashed on top. At each station, if possible, the whitewash coat is inspected. In the event these inspections show the coal has been disturbed, an investigation is made as to where the loss occurred. It is believed this will result in a saving of thousands of dollars' worth of fuel.

Washington, D. C.—The U. S. Civil Service Commission has announced an open competitive examination for the position of supervising mining engineer and metallurgist. The compensation for this position is \$4,000 per year, and the duties will be to take charge of one of the mining experiment stations, authorized by the Act of Congress of Mar. 3, 1915, and established July 1, 1916, to supervise investigations and disseminate information with a view to improving conditions in the mining, quarrying, metallurgical and other mineral industries in the district served by the station, with an especial view to preventing unnecessary waste of resources, and otherwise contributing to the advancement of these industries. Graduation from a college or a university of recognized standing in mining engineering or metallurgy, and at least five years of responsible experience in mining engineering, two of which must have been along metallurgical lines, are prerequisites for consideration for this position. The examination is open to all men who are citizens of the United States, and who meet the requirements. Persons desiring to take this examination should apply for Form 2118, stating the title of the examination desired, to the U. S. Civil Service Commission, Washington, D. C.

Market Department

GENERAL REVIEW

Cold weather stiffens up the anthracite domestic business. Bituminous prices recover. Negotiations on new contracts beginning. Car shortages and embargoes cause uncertainties. Middle Western situation mixed though steady.

Anthracite—The market has stiffened up appreciably under the influence of the protracted cold snap, especially in the retail trade where supplies are at a low point, and dealers are becoming urgent in their demand for coal. A continuation of the low temperatures will develop a serious situation in the domestic trade soon, as many of the consumers who stock up in the early part of the season will shortly be in the market again. The reserve storage supplies of the big companies continue to be taken up very rapidly. The cessation in Lake shipments has diverted some coal to other markets, though not as much as anticipated. Production is not very satisfactory, while the movement is slow, and coal freezing in the cars has delayed handling at destinations. The acute shortage and high prices in the bituminous market has created an almost unlimited demand for the steam sizes.

Bituminous—The cold weather has caused a very sharp recovery in our table of comparative average coal prices back to nearly the same level as last week, though this is largely due to increases in the Middle Western market. The Eastern market is definitely firmer though there are still uncertainties and cross-currents. The closing of Lake navigation has released some extra tonnage for other markets but this is largely overcome by car shortages, delayed movement, and incipient labor troubles throughout the mining regions in spite of wage advances which are being reported in all directions. At the more remote points the storms and inclement weather have had a reverse effect, and there is much anxiety concerning supplies over the holiday period. Discussions over new contracts are proceeding quietly, and it is understood that some of the leading companies will announce prices shortly. There are many new factors coming up for consideration in negotiations on the new contracts which are causing both parties to proceed cautiously. There is a tendency to have contracts date from Jan. 1, and the probability of a pronounced scarcity in European labor for a number of years to come is also causing some concern.

Ohio Valley—Contradictory influences have developed in transportation conditions that have complicated the situation and caused many cross currents. Numerous embargoes of various descriptions have been declared, which tend to exert a depressing influence on prices, while more pronounced car shortages have the reverse effect. The restricted Canadian production has thrown an additional demand on the other markets, while a cessation of Lake shipments has caused no apparent increase in the supplies. Some manufacturing plants have been compelled to suspend operations because of the fuel shortage, and others are threatened with the same difficulty. The more seasonable weather has caused a heavy domestic consumption and there is a general demand for extra tonnages to carry through the light receipts expected during the holiday period. A few of the contracts expiring at this time have been renewed at advances in accordance with existing market conditions, and it is noted that operators' views on this business at the moment are somewhat stiffer than a few weeks ago.

Middle Western—The lower temperatures have steadied up the market causing some advances, though the situation is still rather mixed with soft spots showing. This may be ascribed in part to the customary slowing up over the holiday period, buyers holding off in anticipation of better prices though they are liable to disappointment unless some unseasonably warm weather appears. Railroad embargoes against shipments to the Eastern markets has also been a factor by increasing the car supply. On the other hand there will be an extraordinarily heavy movement of Middle West rail coal to the Northwest which will absorb a considerable tonnage, conservative estimates indicating a shortage of approximately 3,000,000 tons. The unusually bountiful wages accruing to the miners due both to steady operations and advances in the mining scale, will tend to cause protracted celebrations over the holiday period, and restrict output even more than usual.

A year ago—Anthracite supply short with no indications of any relief in sight. Runaway market on bituminous. Further tightening of railroad congestion will create panic conditions. Some consumers hard pressed to keep their plants going. Middle Western roads stocking heavily but the market is not so tight.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

	Last Year	Dec. 23	Dec. 16	Dec. 9	Dec. 2	Nov. 25
Boston						
Clearfields	\$2.25@3.00	\$4.75@5.75	\$4.75@5.75	\$4.75@5.75	\$4.75@5.75	\$4.75@6.00
Cambrials and Somersets	2.50@3.25	5.25@6.25	5.25@6.25	5.25@6.25	5.25@6.25	5.25@6.50
Pocah. and New River ¹	2.80@2.85	7.00@7.50	7.00@7.50	7.00@7.50	7.00@7.50	7.00@7.50
Philadelphia						
Georges Creek	2.75@3.00	6.00@6.25	6.00@6.25	6.00@6.25	6.00@6.50	6.50@7.00
W. Va. Freeport	2.50@2.60	5.00@5.25	5.00@5.25	5.00@5.25	5.00@5.25	5.00@5.50
Fairmont Gas mine-run	1.75@1.85	5.25@5.50	5.25@5.50	5.25@5.50	5.25@5.50	4.75@5.00
Pittsburgh (steam coal) ²						
Mine-run.....	1.25@1.35	4.25@4.50	4.00@4.25	4.25@4.50	4.25@4.50	4.75@5.00
1-in.....	1.35@1.45	4.25@4.50	4.00@4.25	4.25@4.50	4.25@4.50	4.75@5.00
Slack.....	1.00@1.05	3.50@3.75	3.50@3.75	4.00@4.50	4.25@4.50	4.50@4.75
Chicago (Williamson and Franklin Co.) ²						
Lump.....	1.60@1.75	3.75@4.25	3.00@3.50	3.50@4.00	3.50@4.00	3.50@4.50
Mine-run.....	1.10@1.15	3.50@3.75	3.00@3.25	3.50@4.00	3.50@4.00	3.50@4.00
Screenings.....	.85@0.90	3.50@3.75	3.00@3.25	3.50@3.75	3.50@3.75	3.25@3.75
Gross average.....	\$1.81@2.02	\$4.67@5.08	\$4.48@4.90	\$4.69@5.15	\$4.71@5.17	\$4.80@5.33

¹ F.o.b. Norfolk and Newport News. ² Per net ton.

BUSINESS OPPORTUNITIES

Dun—The outstanding and most reassuring feature of the business situation, as it has been for some time, is the increased caution manifest in banking, producing and distributing channels. Foreign developments have accentuated the tendency toward wholesome conservatism, without affecting the progress of finance, or lessening the volume of transactions in trade and industry, and recent speculative readjustments have made the general outlook distinctly clearer. Prices, moreover, no longer are soaring in nearly all lines, though strength continues pronounced in many quarters, and buyers, while operating with sustained confidence, give more consideration to the element of cost in making commitments for the future. Commercial failures this week in the United States are 293, against 333 last week, 247 the preceding week, and 381 the corresponding week last year. Activity in some branches has subsided, as it invariably does at this season, with salesmen coming in from the road for the holidays and annual inventories under way, or in course of preparation. Yet the pressure upon manufacturing forces is undiminished and the difficulties of maintaining outputs at the high point necessitated by the unprecedented consumption increase with shipments of fuel and of raw materials delayed by the freight congestion, which grows rather than lessens in some sections. Labor scarcity also remains a handicap in industrial circles and some new controversies with labor.

Bradstreet—Germany's peace proposal thus far has not exerted any particular effect upon either trade or industry, though it has superinduced sharp breaks in stock market as well as in cereal and flour prices and brought greater caution among financial interests. Incidentally, a more conservative undertone seems to be developing in other directions as regard far future trade. Nevertheless, the high altitudes to which commodity prices have risen dictate prudence in the light of possible developments. But whatever sentiments may be in the making, actual trade trends of the week, taken by and large, manifest nothing but activity, tempered, however, in the larger lines by the fact that seasonal quiet is about due.

Dry Goods Economist—Careful inquiry among the dry goods and department stores in New York shows that the Christmas gift-buying started in on very active scale on Saturday of last week and will doubtless be well maintained until the end of the holiday period. There is no question that similar conditions prevail in the majority of centers throughout the country. Every indication, indeed, points to the retail dry goods trade winding up the year with a record-breaking sales volume. The increase will, of course, be due, in a degree, to the higher prices prevailing, and will be offset to an extent by the increased expense all along the line, from wages to wrapping paper, twine and other supplies. Credit men generally report favorably as to collections from retail concerns.

Marshall Field & Co.—Wholesale dry goods distribution for the current week is maintaining the large volume of the past few weeks and is running considerably ahead of the corresponding period of a year ago. Road orders for both immediate and future delivery show good gains over the same week 1915. Merchants have visited the market in larger numbers. Collections are in excess of the corresponding week of past years.

Atlantic Seaboard

BOSTON

Light receipts at Hampton Roads, with intermittent delays at the piers. Pennsylvania mines operating under difficulties but owners talk new prices. Eastern trade in bad shape for anthracite.

Bituminous—Pocahontas and New River are coming to Tidewater very slowly, and in light volume. Coastwise steamers are obliged to wait one to four days, but with the exception of Government colliers, ships offshore are less frequent. Spot prices continue their even course, although sales are now rather exceptional. Shippers are less inclined to part with coal to other interests, boats of their own requiring all the coal they can get. The range of \$7@7.50, still quoted, is therefore only nominal.

The high volatile grades are not moving to the piers in the volume expected. Unless bottoms are arranged for, the coal is apt to accumulate on demurrage, especially for this market which is not favorable to fuel of that character.

A spell of heavy snow and low temperatures has caused fresh anxiety to consumers here, but so far the agencies are managing to keep up with contracts measurably well. A few uneasy consumers are trying to buy all-rail coal against contingencies, but movement on the latter is spasmodic and extra supplies from that quarter are not much to be relied upon. No spot cargo coal seems to be available, and while marine rates are nominally moderate yet prompt boats are extremely hard to arrange. Distributors who have free coal are still asking up to \$9.50 on cars Providence or Boston.

Discussion continues quietly with regard to 1917 prices, and the question whether the contract year should begin in April or in January. So far as meetings go it is understood there will be no further conferring until after the New Year. Opinion still seems to be divided over what the f.o.b. basis should be. Some are recalling the effort in 1903 to set a high price and the subsequent slump; that, however, was partly occasioned by receipts of foreign coal that are not likely to figure this time.

A few operators are discussing contracts for another year, to replace current arrangements that expire Jan. 1. Production is still low in most districts, hardly more than 50%, but \$3.25@3.50 for twelve months would be likely to look attractive to mine-owners. Curiously enough, there is apprehension on the part of some that not only will there be no fresh labor supply from abroad but that those who have saved money and have regard for their old homes will be inclined to go back to Europe, when the war is over.

Bituminous quotations f.o.b. loading ports at points designated are about as follows, per gross ton:

	Clear-fields	Camb. & Som's't	Geo's. Creek*
Philad'l'a...	\$6.00@7.25	\$6.25@7.50
New York...	6.25@7.40	6.50@7.75
Baltimore...	4.75@5.75	5.25@6.25

*On contract.

Pocahontas and New River are quoted at \$7@ 7.50 f.o.b. Norfolk and Newport News, Va., for spot coal, and \$9.50@10 on cars, Boston and Providence, for inland delivery.

Anthracite—Notwithstanding the optimistic pronouncements of public officials the local market is very low on domestic sizes. The hard part of it is that prospects do not improve. New York loading ports are still congested with boats waiting. Some have actually waited a month's time and receipts continue discouragingly light. Bitter cold weather has set in and consumers are most insistent on deliveries.

It was felt that with the Penobscot and Kennebec definitely closed to navigation shipments might be larger to other ports but the supply of coal and barges is less, if anything.

"Independent" coal has been weaker in price, only about \$1.15@\$1.25 premium being asked f.o.b. New York before the snowstorm, but offerings now are less frequent. The difficulty there also is in securing vessels.

A lot of anxiety is felt here over the probable shortage after the holidays. If the weather keeps cold there will be some exciting times. Retailers are still holding down deliveries to 1/2-ton and 1-ton lots to regular customers. Prices at retail continue on the basis of \$9.50 per net ton.

NEW YORK

Egg and stove sizes scarce. Less fear of a scarcity but buying is steady. Individual coals in heavy demand and steam sizes tight. Bituminous situation stronger. Supplies low and prices advance. Many operators increase wages.

Anthracite—The scarcity of coal continues at Tidewater and a heavy demand would undoubtedly create a serious situation. The recent snow-storm and a considerable drop in temperature caused nothing more than a slight flurry in the market. Demand did not increase with the expected rapidity, probably owing to the general feeling that there would be enough coal to go around. There was only a slight increase in wholesale prices and then only in instances where shippers were short and the prospects of replenishing stocks were slim.

The suspension of Lake shipments has resulted in more coal coming to Tidewater but not as much as was expected.

The amount of individual coal to be had is not large and free cargoes of any of the domestic sizes are soon taken up. The demand along the line is heavy.

Shipments from Port Reading were interfered with by labor troubles and last week's storm, which caused the steam sizes to freeze in the cars making loading difficult. Some shippers were served with embargo orders early this week, while complaints were heard from customers regarding slow deliveries. Cars are short and the labor scarcity at the mines continues.

Retail dealers do not seem anxious to buy heavily with conditions as at present. Some yards are pretty well cleaned out and the proprietors are telling prospective customers that they have no coal to sell.

There is very little broken to be had at Tidewater and for line delivery it is necessary to pay around \$6 at the mines. There was a slight flurry in the market last Monday and Tuesday and a strengthening of prices. Loaded boats of the domestic sizes were quoted at \$8.75 though lower prices would have been taken for them. Quotations on individual coals ranged from \$8 to \$8.50 for egg and stove while chestnut which is freer was quoted about 50c. less.

Pea coal is scarce and shows considerable strength. There is much activity in the buckwheat grades; No. 1 is scarce, rice firm, and barley easy.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken.....	\$4.95	
Egg.....	5.45	\$8.00@ 8.50
Stove.....	5.70	8.00@ 8.50
Nut.....	5.75	7.50@ 8.00
Pea.....	4.00	5.50@ 6.00
Buck.....	2.75	4.75@ 5.00
Rice.....	2.20	3.00@ 3.25
Barley.....	1.95	2.25@ 2.50
Boiler.....	2.20	

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—The tendency towards higher prices and a stronger market continues. There is a good demand but with little free coal to meet it. Receipts at Tidewater are better, owing to the closing of Lake shipments but shippers with free coals do not have any difficulty in disposing of it.

Operators in the Clearfield and Somerset regions have considerable labor and car troubles on their hands. Although many operators in both fields have made wage increases as high as 33% it is doubtful if they will be able to increase production. Most operators have added the wage increases to last year's contract prices and while some consumers have made no objections, strenuous protests have been received from others. The car shortage and curtailed labor supply are becoming more accentuated as the season advances and the chances for improvement are slim.

Contracting for next year is under way on a basis of \$1.50 at the mines. Many new contracts have been signed but there are several large tonnages yet to be closed.

Current quotations, per gross ton, f.o.b. Tide-water, for various grades are as follows:

	South Amboy	Port Reading	Mine Price
Georg's Crk. Big Vein..	\$7.75@ 8.00	\$7.75@ 8.00	\$5.75@ 6.00
Tyson.....	7.25@ 7.50	7.25@ 7.50	5.25@ 5.50
Clearfield..	7.25@ 7.50	7.25@ 7.50	5.25@ 5.50
South Frk..	7.25@ 7.50	7.25@ 7.50	5.25@ 5.50
Nanty Glo.	7.25@ 7.50	7.25@ 7.50	5.25@ 5.50
Som'r Co.	7.25@ 7.50	7.25@ 7.50	5.25@ 5.50
Que'ho'ing..	7.25@ 7.50	7.25@ 7.50	5.25@ 5.50
W. V. Fa'rm't Th'r'qua..	7.25@ 7.50	7.25@ 7.50	5.00@ 5.25
Mine-run....	7.25@ 7.50	7.25@ 7.50	5.00@ 5.25
West. Md..	7.00@ 7.25	7.00@ 7.25	5.25@ 5.50

PHILADELPHIA

Anthracite trade stiffened up by cold and snow. Shipments light and shortage expected during holidays. Steam coal scarce. Bituminous deliveries restricted by snow and poor car supply. Few price changes.

Anthracite—A week of cold weather, together with several snow storms, has brought the conditions anticipated. The demand became so brisk this week that the retailers were compelled to turn orders away in order to conserve supplies for their regular customers.

The weather has been even more severe in the mining regions and production has been curtailed in consequence. It is doubtful at this time if any shipper has one satisfied customer on his books as each one takes the attitude that he is being neglected and his competitors favored.

The small amount of coal in storage is being further depleted at the rate of at least 50,000 tons weekly. While this fuel has been coming out in good preparation the past week has witnessed a number of complaints and in several instances the coal was actually refused. One dealer who has a fairly good stock refused 500 tons of this class of coal, though the same shipments were eagerly taken up by another dealer who was practically out of stock.

Shipments have fallen off quite considerably this week. One large company in particular that shipped rather liberally into this territory last month has fallen down badly so far in December, its tonnage being less than 50% of the previous month. The demand from other markets, neglected while this was being cared for, had to be given their proportion now.

Another cause of suffering in the retail trade was the fact that cars that might have been loaded with domestic sizes have been diverted for use in shipping steam sizes on large contracts that were running dangerously short. The car supply is very poor and did not warrant shipping to both.

With the Christmas holidays now at hand it is felt that with a continuance of the winter weather there will be a decided shortage of coal in the city. The tonnage from Christmas on past New Year's is very small. It also looks now as if the smaller shippers are not to be depended upon as the renewed activities have brought fresh offers from outside points, at attractive prices.

The relative demand for the sizes continues the same as earlier in the month, but with an increased proportion. Broken is seldom mentioned because all buyers without contracts realize their chances are hopeless. This has so increased the demand for egg coal for commercial purposes that the domestic market is neglected and is short at this time. Apparently no dealer has more than a few days' supply of stove while others are without a single pound, and there is no indication that the situation will improve. Dealers have been pushing chestnut, which was easier than stove, until it too is active and in short supply. Sales of pea have been steady all week, as cold weather always brings a quick demand for this size from small buyers, but with stocks fairly good it is most desirable business now.

It is the opinion of at least one big man in the trade that if the winter is severe the real trouble will come toward the end of January, when the householders' stocks among the large and early buyers show signs of needing replenishing.

The steam trade is more than active with an unlimited demand for all produced. Shippers continue to receive inquiries from big consumers of bituminous coal asking for quotations on large tonnages. That the railroads are running short of fuel is evidenced by the fact that this week they confiscated quite a number of cars of buckwheat coal that were en route to local consumers.

The prices per gross ton f.o.b. cars mines for line shipments and f.o.b. Port Richmond for tide are as follows:

	Mines	Tide	Mines	Tide	
Broken....	\$3.60	\$4.75	Buck.....	\$2.00	\$2.90
Egg.....	4.15	5.25	Rice.....	1.25	2.15
Stove.....	4.10	5.60	Boiler....	1.10	2.00
Nut.....	4.50	5.55	Barley....	1.00	1.90
Pea.....	2.80	3.70			

Bituminous—With the added impetus of real winter weather consumers are pressing strongly for increased shipments, but several snow storms have impeded the movement until the trade is now worse off in this respect than it has been

at any time this season. Despite the most persistent efforts, the large consumers are unable to get much more fuel than is required for current consumption.

In many instances it is taking shipments double and often triple the usual time to reach destination. This week the B. & O. announced an absolute embargo against further deliveries of Maryland and West Virginia coal to the P. & R. Ry. at the local junction point, alleging congestion on the latter line. This was vehemently denied by the P. & R. and four hours after notice of the embargo had been given it was suddenly withdrawn.

The stoppage of Lake navigation has in no way favorably influenced local conditions, so far as increased shipments are concerned. The Lake territory is 2,000,000 tons short for the season, which means heavy rail shipments all winter, and the long hauls will decrease the car supply.

Interest is manifested here in the appeal to the Interstate Commerce Commission to have coal cars declared special equipment. Only recently fifteen hopper bottom coal cars roofed over with canvas, arrived here loaded with automobiles. As a matter of fact the small coal cars of 30 tons capacity have entirely disappeared from the trade.

With the first of the year approaching and a good many contracts expiring there is much interest in what action the large companies will take in renewing this business. While it was thought in some quarters that no contract prices would be offered, the report has now become general that at least one of the largest producing companies will announce contract figures shortly.

Prices have changed but little recently, although we think that most sales are now being made beyond the \$5 mark, with probably \$5.50 as an average. We quote a number of the better grades at much higher figures, but the coal is most difficult to obtain even at these prices.

The prices per gross ton at mines current at this time are about as follows:

Georges Creek Big Vein.....	\$6.00@ 6.25
South Fork Miller Vein.....	6.00@ 6.25
Clearfield (ordinary).....	5.25@ 5.50
Somerset (ordinary).....	5.25@ 5.50
West Va. Freeport.....	5.00@ 5.25
Fairmont gas, lump.....	5.50@ 5.75
Fairmont gas, mine-run.....	5.25@ 5.50
Fairmont gas, slack.....	4.50@ 4.75
Fairmont lump, ordinary.....	4.75@ 5.00
Fairmont mine-run.....	4.50@ 4.75
Fairmont slack.....	4.50@ 4.75

BALTIMORE

Snows and unusually low temperatures accompanied by poor car supply, stiffens up soft-coal prices. Complaint of poor coals. Anthracite men having difficulties.

Bituminous—Snowfalls and lower temperatures are creating the stiffest soft coal market in years. Spot coal at tide is bringing big prices selling at Tide on a mine basis of from \$5.25 to \$5.75, or even \$6 in some cases. Heavy snow, over the mountain districts especially, and poor car supply from this and other causes is the big factor. On some days the car supply in the Fairmont district ran as low as 10%, and not much better than a 40 to 60% supply has been the average in all the districts.

Operating interests are holding firm on quotations to the trade, which are about as follows: Georges Creek, Tyson, \$6; Somerset, \$5.50; South Fork, \$5.25 to \$5.50; Clearfield, \$5.50; Quemahoning, \$5.50; Latrobe, \$5; Freeport, \$5; Fairmont gas, 4%, \$5; mine-run, \$4.75; slack, \$4.50.

Anthracite—Demand is brisk as a result of the cold weather. Larger sizes are still particularly short.

Exports—Export movement remains very light. Last week there was but one loading, 6,671 tons for Alexandria, Egypt. During November the export movement here totaled 48,723 tons.

HAMPTON ROADS

Situation easier. Decline in prices. Decreased output expected through the holidays.

Car supply seems to be improving on all of the roads entering Hampton Roads and the supply of coal is increasing which has caused prices to ease off somewhat for the time being. The miners, however, usually take about a week off for the holidays and it is expected that a further shortage is due about the first of the year. It is not to be understood that conditions are normal as yet, but there is no doubt that the situation shows considerable improvement. Most shippers are trying to accumulate a stock to carry them over the holidays, but at present this seems to be impossible.

Coastwise and export shipments are principally on contract for both Pocahontas and New River and some small tonnage of high volatile coal. An occasional coastwise or foreign order for new business is accepted. The scarcity of steamers for exports still causes the chartering of a number of sailing vessels, there being several in port at present.

Prices are about as follows for Pocahontas and New River run of mine: For cargo, both coastwise and export, \$7@7.50 per gross ton f.o.b.; for local delivery, \$7@7.25 per net ton in carload lots; for bunker steamers, \$7@7.50 per gross ton; trimming, 10c. per ton extra. Anthracite \$9 per net ton delivered.

Railroad Tonnages—The following is a comparative statement of the tonnages handled by the different roads for the past several weeks:

	Nov. 27	Dec. 2	Dec. 8	Dec. 15
Nor. & West....	114,406	98,120	155,086	118,293
Ches. & Ohio....	93,038	101,279	13,999	203,551
Virginian.....	83,892	54,447	124,349
Total.....	291,336	173,532	446,193

Ocean Shipping

OCEAN CHARTERS

Coal charters have been reported as follows during the past two weeks:

PHILADELPHIA

Vessel	Destination	Tons	Rate
Munsomo	Havana	2,105	
Sheba	Havana	1,341	
Oceland	Cuba	1,874	
Volkath Tham	Gothenborg	2,726	
Malm	Havana	893	
A. B. Sherman	Martinique	510	\$6.50

BALTIMORE

Carl F. Cressy	St. Croix	776	7.00
Republic	W. C. So. America	3,121	
Lewis K. Thurlow	Fort Limon	2,500	
Boschetta	Buenos Aires	1,150	12.00
Ausable	Buenos Aires		
Maumee	River Plata	1,615	
Narvik	Narvik	2,004	

VIRGINIA

Spica	La Plata	1,231	10.80
Nuceria	Rio Janeiro	2,872	11.50
Mariechen	Santos	2,250	15.00
Kish	Chile	3,148	8.70
Alessandria	River Plata	2,311	10.80
Strix	River Plata	1,633	10.80
Algonquin	Havana	1,172	4.00
Doris	Buenos Aires	1,262	
E. Starr Jones	Canary Islands	787	
Peter H. Crowell	Barbadoes	2,423	8.50

NEW YORK

Albert Soper	Bahamas	268	
Arendal	Bahamas	198	

ATLANTIC RANGE

Bjornefjord	River Plata	17.80	
	River Plata	2,337	17.80

OCEAN FREIGHTS

The freight market is even firmer than a week ago, and the "peace talk," contrary to expectations, has not had any influence on the market. Export orders are accumulating, and very few steamers are obtainable. The only charter worthy of comment, since our last report, was the fixture of the Norwegian steamer "Bjornefjord," 6,000 tons, 10%, from Virginia to Buenos Aires, at \$17.40, with 1,000 tons per day discharge, which rate is very much in advance of the preceding rate paid on similar business.

We would quote freight rates on coal by steamer as follows:

Dec. 11 Dec. 18

West Coast Italy....	\$32.40@33.60	\$33.60@36.00
Marseilles.....	31.20@32.40	31.20@33.60
Barcelona ¹	26.40@28.80	30.00 about
Montevideo.....	16.80 about	18.00@19.20
Buenos Aires.....	16.80 about	18.00@19.20
Rosario.....	18.00 about	20.40 about
Rio Janeiro.....	16.00 about	16.00 about
Santos.....	16.50 about	16.50 about
Chile (good port)....	9.00 about	9.00 about
Havana.....	4.00 about	4.00 about
Cardenas, Sagu.....	5.00@5.50	5.00@5.50
Cienfuegos.....	6.00@6.50	6.00@6.50
Port au Spain.....	8.50 about	8.25@8.50
St. Lucia.....	8.50 about	8.25@8.50
St. Thomas.....	7.50@8.00	7.50@7.75
Barbados.....	8.50 about	8.25@8.50
Kingston.....	6.00@6.50	6.50@7.00
Curacao ²	7.50 about	7.25@7.50
Santiago.....	6.00@7.00	6.00@6.50
Guantanamo.....	6.00@7.00	6.00@6.50
Bermuda.....	5.00@6.00	5.00@6.00
Vera Cruz.....	7.00@8.00	8.25 about
Tampico.....	7.00@8.00	8.25 about

* Spanish dues for account of cargo. ¹ And p.c.
* Or other good Spanish port. ² Net.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight Report.

COASTWISE FREIGHTS

Aside from talk about probable season rates next year on steamers from Hampton Roads to Boston there is very little said about freights. Now and then a boat is found available for a one-trip charter, but the number is small and deliveries are confined to bottoms regularly on contract. \$2 to \$2.25 continues the range, depending on size, with rigid stipulations as to demurrage; \$2.50 has been asked for small barges from Philadelphia to Long Island Sound ports, but no actual charter has been reported.

New York rates on small barges to Providence and New Bedford are still on a basis of \$1.25@1.35, but there are few takers just now on account of extremely slow loading.

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past two weeks:

NORFOLK

Vessel	Destination	Tons
Lilly	Patras, Greece	2,174
Woodburn ³	Montevideo, Uruguay	2,529
Tibag ⁴	Rio de Janeiro, Brazil	3,256
Silvia ⁵	Bagnoli, Italy	4,830
Posillipo ¹	Genoa, Italy	7,102
Edward Pierce ⁴	San Juan, P.R.	6,234
Gulfaxe	Havana, Cuba	1,527
James Rothwell	Kingston, Jamaica	533
Nantwen	Genoa, Italy	7,266
Port Antonio	Kingston, Jamaica	1,139
Lysefjord	Santiago, Cuba	568
Saint Theodore ¹	Savona, Italy	7,367
Ermione ³	St. Georges, Bermuda	557
Aracaty	Pernambuco, Brazil	1,496
Steinstad ⁴	St. Lucia, B.W.I.	3,702
Senator ⁴	Santiago, Cuba	962
Achilles ¹	Cristobal, C.Z.	12,017
Tirreno ¹	Bagnoli, Italy	4,476
Tabor ³	St. Lucia, B.W.I.	5,448
Ellerslie ⁴	Buenos Aires, A.R.	5,274
Ottar ⁵	Puerto Padre, Cuba	1,972
Newlyn	Kingston, Jamaica	6,534
Dominic	Para, Brazil	485

NEWPORT NEWS

Negus ²	Port of Spain, Trinidad	3,901
Harald ²	Havana, Cuba	4,597
Gardiner G. Deering ²	San Juan, P.R.	2,778
Kennebec ²	Bridgetown, Barbados	2,796
Edward E. Birry ²	Ciudad Guayana, Venezuela	2,440
Lydia M. Baxter ²	Ciudad Bolívar, Venezuela	2,115
Wellington	Dakar, F.W.A.	6,087
Henrik Lund ²	Rio de Janeiro, Brazil	2,150
Margarcia ²	Cayo Francis, Cuba	3,095
Absalom ²	Antilla, Cuba	2,067
Pamela ²	Huelva, Spain	2,067
Augusta W. Snow ²	Port of Spain, Trinidad	1,047
Clothilde Cuneo ²	Curacao, D.W.I.	1,055
Foerde ²	Havana, Cuba	3,084
Clarissa Radcliffe	Genoa, Italy	8,626
Henry O. Barrett ²	Port of Spain, Trinidad	2,454
Malm ²	Sagua la Grande, Cuba	1,743
Munorway ²	Havana, Cuba	5,900
Lodaner ²	Havana, Cuba	4,200

PHILADELPHIA

Vessel	From	To	Tons
Oquendo	Newport News	Callo	4,490
Thisledhu	Barry Dock	Balboa	4,474
Santa Catalina	Newport News	Iquique	6,657
Saint Hugo	Norfolk	Mejillones	5,632

Lake Markets

PITTSBURGH
Embargoes and car shortages influence market in opposite directions. Contract prices discussed. Talk of Steel Corporation buying Pittsburgh Coal Co.

The market has become still more complicated and prices show a wider range than ever. Until very recently the chief difficulty shippers had to contend with was the scarcity of cars, but embargoes have so multiplied that they are fully as important a factor. These two influences act in opposite directions as to market prices; car shortage tends to send prices up while embargoes tend to send them down. The result is that coal is held for much higher prices on some divisions than on others, while even on the same division prices fluctuate sharply. On one day this week a shipper quoted in the morning \$4.15 and in the afternoon asked \$4.75 for the same grade of coal on the same division, evidently having effected some sales meanwhile but still having coal to offer.

The P. & L. E. is embargoed at practically all points, though its own lines are free. The Pennsylvania presents a very complicated case.

The rumor has arisen in stock market circles that the coal contract between the Pittsburgh Coal Co. and the U. S. Steel Corporation is to terminate Mar. 31, 1917, though this is incorrect. The contract was made in April, 1915, and runs 25 years to Apr. 1, 1930. It provides for the requirements of the corporation's subsidiaries in

the Pittsburgh and valley districts and the mining and transportation interests in the Northwest, and is on a sliding scale, according to the union mining rate in the Pittsburgh coal district. The purchase of the coal company by the Steel Corporation, however, seems to be a possibility.

A contract for coal for the calendar year 1917 has been closed at \$2.60 for mine-run, per net ton at mine, Pittsburgh district, but there is little business to be closed for that period. Many contracts expire Mar. 31. It is understood that 30 days ago the leading interest had in mind to ask \$2.50 for the twelve months beginning Apr. 1 next, but that lately its views have advanced. We quote spot coal the same as a week ago: Mine-run, \$4.25@4.50 for steam and \$4.50@5 for gas, with slack at \$3.50@3.75, per net ton at mine, Pittsburgh district.

BUFFALO

BITUMINOUS shows less strength, but shippers remain confident. Car situation grows worse. Anthracite in heavy demand on account of the cold weather. Supply better.

BITUMINOUS—The market is very unsteady, with scarcely any two shippers taking the same view as to prices. However, the actual demand is more insistent than formerly, due to the colder weather and because of the scarcity of Canadian coal and also because the Ohio coal has suddenly dropped out of this market mostly, on account of the almost solid Eastern embargo against it. Never have the roads been in such condition; apparently they will soon be unable to move anything.

Although the last two or three days have shown a little more strength than formerly, prices are hardly as high as they were a week ago. At the same time the consumers refuse to be stampeded any more and buy only when they need coal. The possibility of snow blockades or increased mine difficulties does not have much visible effect.

Quotations are about 25c. lower than last week on everything but slack, which is much stronger than sizes, as follows per net ton:

Youghiogheny Gas.....	\$5.25@5.75
Pittsburgh Steam.....	5.00@5.50
Ohio No. 8.....	5.00@5.50
Cambria Co. Smithing.....	4.75@5.25
Allegheny Valley.....	4.75@5.25
Pennsylvania Smokeless.....	4.90@5.40
All Slack.....	4.75@5.25

All quotations are f.o.b. Buffalo, with the eastern market somewhat stronger than this one.

ANTHRAZITE—The week of cold weather has increased the demand, but the shippers claim to have a much larger supply. If they continue to turn in all the surplus derived from the Lake trade there ought to be a good distribution from this time on, though the clamor will go on till the last bin is full, unless mild weather returns. There is a special scarcity of stove, but a shipper remarks that it would be a poor consumer who could not adapt his fires to the use of egg in place of stove, so he is not disturbed by the situation.

The Lake trade closed on Dec. 13, when two large cargoes were loaded for Milwaukee. December was very active in spite of the numerous storms, which interfered seriously with the movement of tonnage. Shipments for the month were 133,000 net tons and for the season, 2,802,810 tons, as against 3,864,072 tons for the season of 1916. It is expected that the shipments of coal at Erie Penn., by Buffalo shippers, due to the Buffalo dock being out of service, will about make up this loss.

DETROIT

Steam coal active with prices firm. Zero weather creates urgent demand for domestic grades. Lake shipments completed.

BITUMINOUS—Users of steam coal are buying steadily with practically no surplus stock in sight. The strongest demand is for nut, pea and slack, the mine quotation for which ranges from \$4 to \$4.25 with only a limited amount of coal obtainable. Some of the wholesalers are predicting a further advance in this size is likely in the near future. On mine-run, the quotation is \$4.25 at around \$4.50.

Temperatures ranging from below zero to 10 or 12 deg. above, brought a largely increased demand for domestic coal. Retail yards are having considerable trouble to supply the needs of customers. Smokeless lump and egg is selling on the basis of \$4.75 at the mines. Hocking and West Virginia lump are to be had in small quantities at from \$4.50 to \$4.75 at the mines.

ANTHRAZITE—Incoming shipments of anthracite have been small, owing to the numerous embargoes and stocks in retail yards are running low. Though consumers have been able to get enough to provide for immediate necessities the distribution is limited by most of the yards to one or two tons. While none of the anthracite grades are plentiful, there seems to be considerably less stove coal than either egg or chestnut.

Lake Trade—The last coal cargoes of the season are now being moved over the Lake route to Milwaukee, where there is a considerable deficit. The sudden coming of zero weather caused several vessel owners to cancel contracts that had been made for delivery at Sault Ste. Marie and other points. Shippers have been paying about \$1 a ton on cargoes to Milwaukee.

TOLEDO

Cold weather stimulates the trade. More domestic buying.

The biting cold weather of the past week has stimulated the market and coal is much stronger than it was during the previous two weeks when the unusually warm weather resulted in restricting the demand. Dealers are buying more freely than they have been for three or four weeks back. The greatest difficulty now is the transportation problem, but Toledo is in better shape than most cities.

Lake shipping is now, of course, at an end and this will release many coal cars which have been kept strictly in the Lake trade. Domestic lump is quoted from \$3.75@4.50 at the mines and steam coal is ranging between \$3 and \$4.

CLEVELAND

Cold weather and car shortage causing advance in prices. Railroad embargoes cutting down daily receipts more than 50%.

The cold weather and poor car supply at the mines has stiffened the Cleveland market very materially and prices have advanced from 50c. to \$1 on steam coals, while domestic grades have advanced from \$1 to \$2 at wholesale. The natural gas shortage has also been a factor in local market prices and if this continues any length of time prices will be much higher by the holidays as receipts are not 50% of requirements. This latter condition is due to the fact that one of the largest coal roads entering Cleveland has placed an embargo on all shipments here.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8.....	\$5.00	\$5.00	\$4.75
Cambridge.....	5.00	5.00	4.75
Middle Dist.	4.75	4.75	4.50
Hocking.....	4.75	4.75	4.50
Yough'gheyn.....	5.50	5.50	5.00
Pittsburgh.....	5.50	5.50	5.00
Pocahontas.....	7.00	7.00	6.50
Fairmont.....	4.75	4.75	4.50

COLUMBUS

Zero weather has caused considerable strength. Shipments delayed both by car shortage and congestion. Continuation of high prices expected.

Domestic demand is one of the strongest points in the market. Dealers' stocks were not increased materially during the warm spell and the lower temperature caught them unprepared for the rush of orders; as a result they have been compelled to apportion their supply to various customers. Retail prices are at the high levels which prevailed for several weeks, and no cutting is reported. Pocahontas and other fancy grades are in good demand. Hocking lump is also moving briskly.

Steam business is also strenuous as manufacturers and other large steam users have little surplus stocks on hand. Railroads have been unable to make prompt deliveries and some plants have been compelled to close down temporarily. Railroads are also taking a large amount of fuel for the movement of trains.

The Lake trade is now over as the last cargoes left the lower Lake ports about Dec. 13. The season as a whole was a prosperous one and the Hocking Valley docks at Toledo loaded 4,018,658 tons during the season. Active preparations are being made for a busy Lake season in 1917.

Production in Ohio field has been rather low because of car shortage and above all congestion at junction points.

Prices on short tons, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern
			Ohio
Rescreened lump.....	\$4.00	\$4.50	4.00
Inch and a quarter.....	4.00	4.50	4.00
Three-quarter inch.....	3.75	4.25	4.00
Nut.....	3.75	4.00	4.00
Egg.....	3.75	4.00	4.00
Mine run.....	3.50	3.75	4.00
Nut, pea and slack.....	3.50	3.50	4.00
Coarse slack.....	3.50	3.50	4.00

CINCINNATI

Extremely cold weather has stimulated domestic demand, and prices have stiffened accordingly. Steam grades are still scarce and high. Some plants closed on account of lack of fuel.

Unusually severe weather, with temperatures around zero for several days in succession resulted in the usual heavy emergency demand for domestic coal, forcing dealers into the market to keep their rather limited stocks in shape. The result has been the best call for prepared coal yet experienced, at almost any price asked. The steam coal situation does not seem to have been affected by the improved domestic demand, largely because the resulting movement has not yet brought the coal to this market. Screenings continue very short and has resulted in the closing of a number of manufacturing establishments around Cincinnati.

Prices have again become erratic, with nut and slack as high as \$4@4.25 f.o.b. mines for the better grades of bituminous, although lower figures are reported as well. Pocahontas cannot be said to have improved, as it has always been at the top of the market and in limited supply.

LOUISVILLE

Cold weather and insufficient car supply stiffen Kentucky market. Prices advancing and operators predict higher market.

Arrival of weather approaching the zero mark throughout this section together with the holidays and lessening supply of cars has greatly stiffened the Kentucky coal market. The retail trade, buying on a hand to mouth basis, is making insistent demands for coal, while the steam market continues firm and active. Some of the important operators are reporting a two-day supply of cars only and are making predictions that domestic sizes will go to \$6 and perhaps higher at the Eastern Kentucky mines during January. Efforts being made by dealers and industrial consumers to supply themselves for over the holidays have contributed to the increased strength.

Eastern Kentucky notes sales, f.o.b. the mines, of \$4 for block, on up to \$5 for fancy grades; egg, \$3.75; mine-run and nut and slack, \$3.50. Steam sizes command a practically uniform price. Western Kentucky notes prices stronger but unchanged, with the demand greater than the supply as follows: Lump \$2.85@3; mine run, \$2.25@2.75; nut and slack, \$2@2.25; pea and slack, \$1.25@1.50.

BIRMINGHAM, ALA.

Demand eased up considerably, but prices remain firm. Consumers demanding heavy deliveries, but movement hampered by scant car supply.

While inquiries for coal have only been fair during the past week, customers who have contracted for their requirements are insistent on deliveries being made and a great deal of effort has been expended by the operators to secure a more liberal supply of cars. Mines not holding contracts with the railroads for fuel have been the worst sufferers from poor car service, particularly the domestic operations. One company operating with convict labor and necessarily being compelled to run full time, has had dumped several thousand tons of coal on the ground.

Quotations have not changed materially from a week ago, and are as follows per net ton f.o.b. mines on steam grades: Big Seam, mine-run, \$2.50@4; washed-mine-run and washed nut \$3.75@4.25; Pratt, Black Creek and Cahaba, mine-run, \$4@4.25; washed-mine-run and washed nut, \$4. Carbon Hill, washed-mine-run and washed nut, \$4. Domestic grades are \$4@5 per net ton mines.

Coke

CONNELLSVILLE

Spot furnace and foundry coke sharply advanced again. Contract coke scarce. Production and shipments slightly increased.

The week opened with spot furnace coke about 75c. higher and with prospects of a further stiff advance during the week on account of some of the men beginning their regular holiday celebration before the end of the week. Spot foundry coke was bought freely last week at \$10 and one prominent seller opened this week by quoting \$12, expecting that level to be reached very shortly. The coke shortage is more pronounced. Coke movement is not interfered with by embargoes nearly as much as coal movement. Many of the blast furnaces are short of coke and some pig-iron production has been lost in consequence, but not a great deal.

There are only vague rumors as to contract furnace coke, some reports having it that \$5 has been paid both for the first half of 1917 and for the entire year. A prominent Cleveland merchant furnace interest has sent an inquiry to many producers, mentioning no tonnage but asking how much is offered and what is the price. This interest has covered for some of its furnaces but not all, and it is known that it sold considerable pig iron last August for first-half 1917 delivery, before the sharp advances that have occurred in pig iron and coke.

We quote: Spot furnace, \$9@9.50; contract, \$4.50@5; spot foundry, \$10@12; contract, \$5.50@7.50, per net ton at ovens.

The "Courier" report production in the Connellsville and lower Connellsville region in the week ended Dec. 9 at 424,765 tons, an increase of 5,388 tons, and shipments at 430,039 tons, an increase of 17,629 tons.

Buffalo—The demand is good and with the scarcity of men and cars, prices are naturally very strong. Shippers quote 72-hr. Connellsville foundry at \$10.85, f.o.b. Buffalo, with furnace about the same price and high sulphur and stock at \$8.85. All furnaces in this section are running actively, with many unfilled orders.

Birmingham, Ala.—There is little business being booked in the coke market for the reason that there is practically no free coke to offer. The market is strong and a good tonnage could be sold, but producers are turning out a maximum output to supply the heavy demand of their contract customers, and have little to satisfy the demands of the spot trade. Foundry coke is quoted at \$10 per net ton ovens, and furnace coke is not to be had at any price, as every ton of the anticipated production has been contracted

for. The movement of coke to the Texas and Pacific coast territory has been accelerated recently by additions of new box car equipment received by the Southern Pacific.

Chicago—Spot shipments of byproduct coke sizes are practically unknown. A shipment here and there of free tonnage brings premium figures. Furnace and foundry sizes are not easy to obtain at \$9. Quotations are up to the highest point ever reached, and all signs point to their being maintained during the balance of the winter.

The market is quotable as follows per net ton f.o.b. cars Chicago:

Connellsburg	\$9.00@10.00
Wise County	9.00@10.00
Byproduct foundry	9.00@10.00
Byproduct domestic	9.50@10.50
Gas house	8.00@ 9.00

Middle Western

GENERAL REVIEW

Zero weather causes rapid tightening in the Western Markets. Quotations reach new high levels on all grades. Anthracite stocks about exhausted. Smokeless coals very strong.

An average increase of 25c. per ton in the price of all grades of Western coals is shown since last week. Insistent demands are coming in from all directions. Those who felt early last week that the situation was growing easier had a rude awakening when the weather became much colder toward the end of the week.

Prices are strong, with every evidence of reaching higher levels in the near future. The approach of the Christmas holidays when production will be greatly curtailed is likely to render the situation more stringent. Retailers already report greatly increased activity with higher prices quoted to the consuming trade.

The general opinion is, now that cold weather is upon us, that continued activity will prevail such as was felt in the latter part of November, at just as high if not higher prices until about the end of February. Owing to heavy contract obligations, quite a number of Western mines are not feeling the beneficial effects of high prices now prevailing, due to short car supply and restriction of tonnage, most of which is being applied on contracts at prices fully 50 per cent. below those now in effect for open shipments.

Requirements of the Northwest are heavier than in any previous year. The dock interests are apportioning shipments to interior points as circumstances and conditions arise. Undoubtedly the rail movement of Indiana and Illinois coals to the Northwest will be very heavy in the later months of the winter. A good many dock shippers will find their stocks of anthracite cleaned out by the end of this month.

A good many consumers of anthracite in that section will also be obliged to substitute bituminous coals from Indiana and Illinois mines this winter. It is now known that there is a shortage of approximately 3,000,000 tons on all of the docks from Chicago north to Duluth. Conservative estimates indicate an increase in consumption by the Northwestern states of about 25 per cent., owing to greater industrial demand and larger use of coal for household purposes.

CHICAGO

Coal shortage commencing to be felt. Storage piles very low and receipts light. All prices very strong, owing to cold weather, with indications of going much higher.

Some of the best informed wholesalers in Chicago claim that there is only enough coal on hand here to supply demand for ten days at a maximum, with no prospect that any relief can be expected if wintry weather continues. Large industrial users are complaining that they can only obtain approximately 50 per cent. of their requirements. Some of them have ceased to depend upon contracts and are trying to buy tonnage in the open market.

Car supply has been very short in the Franklin County field. Domestic sizes have been ranging from \$3.75 to \$4.50 and mine-run has sold as high as \$4. Screenings from the southern Illinois field have been sold readily at \$3.50 to \$3.75. Saline County mines have been badly hit by shortage of cars, which has been worse in that field than elsewhere.

Demand from the Northwest is increasing, and from other sections it is strong and steady. The holiday season will be celebrated by the miners with more than usual vim this year, owing to the good wages they have been drawing, and there is no gauging what the production will be for a week or ten days commencing Dec. 25.

The easier tendency shown on central Illinois coals early last week was dispelled at the close by a much stronger demand, domestic sizes selling at from \$3.75 to \$4, and all other grades commanding not less than \$3.50. The call for screenings from the Fulton and Peoria districts is very strong, prices ranging around \$3.25. Domestic coal from these mines was selling as high as \$4.25 toward the close of the week.

The demand for Indiana coal is much stronger than last week. The cold wave has caught hundreds of consumers with little fuel on hand, and they are pushing retail dealers for immediate de-

livery. Domestic lump is selling at from \$3.75 to \$4 and steam coals around \$3.50.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Springfield	Fulton & Peoria Cos.	Clinton & Sullivan Cos.	Green & Knox Cos.	Carterville
Domestic lump.....	\$3.75@4.00	\$3.50@3.75	\$3.75@4.00	\$3.75@4.00	\$4.00@4.50
Steam lump.....	3.50@3.75	3.00@3.50	3.50@3.75	3.25@3.50	
Egg.....	3.50@3.75	3.25@3.50	3.75@4.00	3.50@3.75	3.75@4.25
Nut.....	3.50@3.75	3.00@3.50	3.50@3.75	3.25@3.50	
Mine-run.....	3.50@3.75	3.00@3.50	3.50@3.75	3.50@3.75	4.00@4.50
Screenings.....	3.00@3.50	3.00@3.50	3.50@3.75	3.25@3.50	3.00@4.50
Wlmsn. & Franklin. Cos.		Saline & Harrisburg	Poca. & W. Va. Smokeless	Penna. Smokeless	Eastern Kentucky
Lump.....	\$3.75@4.25	\$3.75@4.00	\$5.00@5.50	\$5.00@5.50	\$4.00@5.50
Egg.....	3.75@4.00	3.75@4.00	5.00@5.50	5.00@5.50	3.50@5.00
Nut.....	3.75@4.00	3.50@3.75			
No. 1 nut.....	3.75@4.00				
No. 2 nut.....	3.75				
No. 3 nut.....	3.50@3.75				
No. 1 washed.....	3.50@4.00				
No. 2 washed.....	3.75				
Mine-run.....	3.50@3.75	3.50	4.50@5.00	4.25@5.00	
Screenings.....	3.50@3.75	3.50			
Hocking Lump \$4.00.		Splint Lump \$4.00@4.25.			

Smokeless coals are very firm, mine-run selling around \$4.75 to \$5 with lump and egg quoted as high as \$5.50. Movement of contract tonnage shows no material change, although some complaints are made by retailers that they are very short. Contracts are commencing to be considered, but so far there has not been much tendency on the part of Chicago retail dealers to enter into definite arrangements at the high prices quoted for next season's deliveries.

Hocking has been in fairly firm demand, and former high prices have been very nearly reached. Splint shipments are short, and 1½-in. lump is selling at around \$4.25. Reconsignment restrictions on Kentucky coal still hamper movement. Prices range between \$4.50 to \$5.

The docks are practically bare of anthracite, with a strong demand still maintained. Dependence for fresh supplies is now solely on all-rail shipments from the mines. Premiums of \$2 to \$3 per ton are being offered, with little tonnage forthcoming. Shippers and retailers are apportioning anthracite as circumstances permit, and altogether the hard-coal situation in the West is a very unsatisfactory one.

ST. LOUIS

Market is easier in spite of winter weather. Car supply plentiful. Country inquiries at the minimum. All steam sizes in good demand. Slight decline in prices, but market generally firm.

Weather conditions this week have been favorable for a good market, which has served to steady the situation up. The country demand has fallen off and the inquiries are light with the exception of from such distributing points as Kansas City, Omaha, Minneapolis and Chicago; at times some pretty fair prices are paid for coal in transit to these points. There has, however, been a slight surplus of coal in the Standard field and cars while not as plentiful as last week, have been more than ample for the requirements.

There is a tendency to delay buying until the holiday season, as this is the time that the domestic demand falls off and this will enable the steam trade to buy cheaper coal. This has been the custom in past years, but it is probable that buyers will be disappointed this year unless the month finishes up with some extremely warm weather.

The embargoes against shipments of Illinois coal to Detroit has eased up the local market, and there are also some embargoes in effect at Toledo. As soon as these are lifted an unusual demand may develop in those centers.

Steam sizes are still in good demand and are bringing as much as domestic sizes in a general way. On Williamson-Franklin County coal there is not much retail demand and steam buyers are finding it more profitable to buy from the Standard field with a lower rate and a lower price. The high-grade coal is bringing good prices in the North and West. The car supply in that field this week was better than normal. There has, however, been a falling off in the local price on this coal as well as in the country. A few plants are storing this grade now, figuring that the market will be stronger after the first of the year.

In the Mt. Olive and Staunton field about \$2.75 for screenings, and up to \$3.50 for 6-in. domestic lump is the range. In the Standard field the outside price ranges from \$2.50 for screenings, 2-in. lump and mine-run up to as high as \$3.25 for 6-in. lump.

Contract conditions in St. Louis and restrictions of equipment on the short-line coal roads keep the St. Louis prices from 50c. to as high as 75c. per ton under some of the outside prices on Mt. Olive, Staunton and Standard.

The best tonnage of anthracite that has come into the local market for two months or more arrived this week. There was also a small tonnage of smokeless about 10 to 15 cars. Smithing coal is extremely scarce and no shipments have been received here for some time and nothing is promised.

Local operators are looking forward to the coming season rather expectant, feeling that they are

going to participate in the future in some Indiana and Michigan business on account of their ability this winter to take care of the trade in that territory that other fields have fallen down on.

	Fulton & Peoria Cos.	Clinton & Sullivan Cos.	Green & Knox Cos.	Carterville
Domestic lump.....	\$3.75@4.00	\$3.50@3.75	\$3.75@4.00	\$4.00@4.50
Steam lump.....	3.50@3.75	3.00@3.50	3.50@3.75	3.25@3.50
Egg.....	3.50@3.75	3.25@3.50	3.75@4.00	3.50@3.75
Nut.....	3.50@3.75	3.00@3.50	3.50@3.75	3.25@3.50
Mine-run.....	3.50@3.75	3.00@3.50	3.50@3.75	4.00@4.50
Screenings.....	3.00@3.50	3.00@3.50	3.50@3.75	3.00@4.50
Wlmsn. & Franklin. Cos.		Saline & Harrisburg	Poca. & W. Va. Smokeless	Eastern Kentucky
Lump.....	\$3.75@4.25	\$3.75@4.00	\$5.00@5.50	\$4.00@5.50
Egg.....	3.75@4.00	3.75@4.00	5.00@5.50	3.50@5.00
Nut.....	3.75@4.00	3.50@3.75		
No. 1 nut.....	3.75@4.00			
No. 2 nut.....	3.75			
No. 3 nut.....	3.50@3.75			
No. 1 washed.....	3.50@4.00			
No. 2 washed.....	3.75			
Mine-run.....	3.50@3.75	3.50	4.50@5.00	4.25@5.00
Screenings.....	3.50@3.75	3.50		

Hocking Lump \$4.00. Splint Lump \$4.00@4.25.

The local St. Louis price per short ton f.o.b. mines is:

	Williamson and Franklin Co.	Staunton	Standard
6-in. lump.....	\$2.75@3.00	\$2.50@2.75	\$2.25@2.50
3x6-in. egg.....	2.75@3.00	2.50@2.75	2.25@2.50
2x3-in. nut.....	2.75@3.00	2.50@2.75	2.25@2.50
No. 2 nut.....	2.75@3.00		2.25@2.50
No. 3 nut.....	2.75@3.00		2.25@2.50
No. 4 nut.....	2.75@3.00		2.25@2.50
No. 5 nut.....	2.75@3.00		2.25@2.50
2-in. screen-ings.....	2.75@3.00		2.25@2.50
2-in. lump.....			2.25@2.50
3-in. lump.....		2.25@2.50	2.25@2.50
Steam egg.....	2.75@3.00	2.25@2.50	2.25@2.50
Mine run.....	2.75@3.00	2.25@2.50	2.25@2.50
Washed			
No. 1.....	2.75@3.00	2.75	
No. 2.....	2.75@3.00	2.50	
No. 3.....	2.75@3.00	2.50	
No. 4.....	2.75@3.00	2.50	
No. 5.....	2.75@3.00	2.50	

Rate on Williamson and Franklin County is 72½c. Rate on other fields is 57½c.

General Statistics

COAL MOVEMENT

Fuel shipments over 13 leading Eastern carriers for September and 9 months of 1915-16 were as follows, in short tons:

Classes and Railroads

Anthracite:

	September	1915	1916	9 Months
Baltimore & Ohio.....	105,480	148,440	896,778	1,088,660
Buffalo, Rochester & Pittsburgh.....	8,421	11,272	111,386	120,584
Buffalo & Susquehanna.....	674	477	4,648	4,759
Chesapeake & Ohio.....	1,954	2,219	11,498	11,952
Erie.....	848,302	624,131	6,762,747	6,942,305
Huntingdon & Broad Top Mountain.....	90	109	339	574
Pennsylvania.....	783,307	1,062,119	7,594,600	8,829,867
Pittsburgh, Shawmut & Northern.....	483	86	7,760	8,570
Virginian.....	393	174	1,481	2,763
Western Maryland.....	23,911	31,159	239,027	256,460
Total.....	1,773,015	1,880,186	15,630,264	17,266,494

BITUMINOUS

	September	1915	1916	1915	1916	1915
Baltimore & Ohio.....	3,198,214	3,035,771	24,175,344	26,825,749		
Buffalo, Rochester & Pittsburgh.....	677,785	862,320	5,377,952	7,057,816		
Buffalo & Susquehanna.....	114,831	127,222	748,292	1,129,495		
Chesapeake & Ohio.....	2,162,958	2,156,411	16,572,295	20,390,443		
Erie.....	693,615	706,312	4,761,581	6,415,524		
Huntingdon & Broad Top Mountain.....	95,426	112,364	712,582	870,344		
New York Central (Buffalo and east).....	568,045	595,926	4,491,339	5,780,972		
Norfolk & Western.....	2,659,094	2,732,084	19,302,642	23,409,869		
Pennsylvania.....	3,901,402	3,946,824	31,604,477	36,523,300		
Pittsburgh, Shawmut & Northern.....	168,950	215,261	1,608,789	2,235,703		
Virginian.....	374,340	491,533	2,915,704	4,003,219		
Western Maryland.....	797,806	848,295	6,339,903	6,404,036		
Total.....	15,412,466	15,830,323	118,610,900	141,044,471		

NORFOLK & WESTERN

The following is a statement of coal handled by the N. & W. Ry. during November and the preceding two months in short tons:

	September	October	November
Pocahontas.....	1,577,193	1,501,217	1,475,740
Tug River.....	316,868	318,618	310,884
Thacker.....	295,628	267,376	245,621
Kenova.....	84,392	89,740	91,571
Clinch Valley.....	118,974	123,408	138,032
Miscellaneous.....	2,709	6,380	9,687
Total N. & W.	2,395,764	2,306,739	2,271,535
Wlm. & Pond Ck.	122,939	105,615	116,977
Tug R. & Ky. R.R.	55,605	57,202	51,436
Other roads....	468,611	440,521	340,230
Grand total....	2,982,919	2,910,077	2,780,178

Foreign Markets

GREAT BRITAIN

Nov. 30.—There has been some slight improvement in coal values owing to the somewhat increased demand. The dispute between masters and men, owing to a demand of the latter for more wages, is likely to be settled amicably. Quotations are as follows:

	Best Welsh steam	Nominal
Seconds.....	\$6.96@7.20	Nominal
Best dry coal.....	6.48@6.72	
Best Monmouthshire.....	6.60@6.84	
Seconds.....	6.24@6.48	
Best Cardiff smalls.....	4.56@4.80	
Cargo smalls.....	4.20@4.32	

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering during the past week has been much better, and in some directions quite active. The feature has been the increase in the Port Said rate, owing to heavy chartering for this port.

Freight rates are as follows:

	Gibraltar.....	Port Said.....	\$19.20

<tbl_r cells="4" ix="5" maxcspan="1" maxrspan="1